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ELEMENTS

OF

Juridical or Forensic Medicine,

&c. &c.

" Danger may arise from the evidence and opinions of physical people, who are called in to settle questions in science, which judges and jurymen are supposed not to know with accuracy. Many of our profession are not so conversant with science as the world may think; and some of us are a little disposed to grasp at authority in a public examination, by giving a quick and decided opinion, where it should have been guarded with doubt: a character, which no man should be ambitious to acquire, who, in his profession, is presumed every day to be deciding nice questions, upon which the life of a patient may depend."----Dr. Wm. Hunter *on the Uncertainty of the Signs of Murder in Bastard Children.*

" Legum scientia atque Medicina sunt veluti quadam cognatione conjunctæ, ut qui jurisperitus et idem quoque sit Medicus."

ELEMENTS

OF

Juridical or Forensic Medicine;

FOR THE USE OF

MEDICAL MEN, CORONERS,

AND

BARRISTERS.

BY

GEORGE EDWARD MALE, M. D.

MEMBER OF THE ROYAL MEDICAL SOCIETY OF EDINBURGH, AND ONE OF THE
PHYSICIANS TO THE GENERAL HOSPITAL IN BIRMINGHAM.

SECOND EDITION,

MUCH ENLARGED AND IMPROVED.

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TO

SIR SAMUEL ROMILLY, M. P.

&c. &c.

This Volume

IS RESPECTFULLY DEDICATED,

BY

HIS VERY OBEDIENT HUMBLE SERVANT,

THE AUTHOR.

CONTENTS.

PAGE
PREFACE 1
History of Juridical Medicine 7

CASES WHICH COME BEFORE CORONERS' COURTS.

Poisons 19
Animal Poisons 31
Hydrophobia 32
Cantharides 34
Vegetable Poisons 36
Prussic Acid 46
Mineral Poisons 49
Lead 49
Copper 57
Arsenic 62
Mercury, Corrosive Sublimate, &c. 85
Antimony 95
Nitrate of Silver 97

PAGE
Phosphorus 99
Nitrate of Potash or Saltpetre 100
Mineral Acids 101
Sulphuric Acid 105
Muriatic Acid 106
Nitric Acid 106
Oxalic Acid 106
Aerial Poisons 108
Wounds and Contusions 114
Lightning 121
Apparent Death 124
Infanticide and concealed Birth 128
Abortion 152
Rape 165
Catamenia 174
Venereal Affections 176
Pretended Rape 177
Hanging and Strangulation 178
Drowning 185
Dangerous Inebriety 199

CIVIL COURTS.

Insanity 202
Pretended Diseases 236

PAGE
Imputed Diseases 242
Pregnancy 246
Pretended Delivery 249
Retarded Delivery 250

ECCLESIASTICAL COURTS.

Impotence 254
Medical Men bound to give evidence in a Court of Justice 263
Hermaphrodites 264

ERRATA.

Page 49, *for* internal, *read* external.
61, *for* virdigris, *read* verdigris.
72, line 16, *dele* are.
80, line 5, *for* and add, *read* or.
194, in the note, *for* menime, *read* minime.

INTRODUCTION

TO THE SECOND EDITION.

THE first edition of this work was published for reasons stated in the preface, with some precipitation: a second having been called for, I am induced to offer one, which I hope will be found more perfect and correct than the former; several considerable additions have been made, some errors and inaccuracies corrected, and the whole newly modelled and arranged. The subject does not admit of correct systematic order; that which I have adopted, and appears to me to be the best, is in relation to the Courts in which cognizance is taken of the particular matters treated of: the arrangement is, however, necessarily defective, the same subject being under different circumstances, referrible to different courts.

It has been intimated, that from its conciseness, this work is rendered less extensively useful. I am, however, inclined to attribute its utility, (if it possess any) to its easy reference and condensed brevity; large and expensive books are seldom read, and are within the reach only of a few—and I am not aware that there are any important facts omitted, the knowledge of which is necessary to a practitioner called upon in a case of Forensic Medicine, or requisite to enable him to deliver his evidence in a manner not discreditable to him in a Court of Justice: were I to extract the speculative opinions of some of the continental writers, (often sufficiently credulous and absurd) I might easily compile a great book, but I should depart from my original plan. Those who have perused these tedious and prolix publications, must be aware that they are not adapted to the jurisprudence of this country, nor to the present state of chemical knowledge, and all that is valuable in them (except in the recent system of Toxicology by Orfila) is compressed in the works of Metzger and Mahon.

PREFACE.

THE object proposed by publishing these pages is, to put into the hands of medical men a concise Essay on Poisons and their Remedies, with a collection of those tests which are most to be relied upon for ascertaining their presence: also to point out what is necessary to be attended to in cases of sudden or violent death, that they may be prepared to state their evidence before a Coroner, or in a Court of Justice, in a manner reputable to themselves and satisfactory to the public. I am not acquainted with any work in the English language which treats fully on this subject: to one written in Latin* by Professor Plenck, of Vienna, I am indebted for many valuable remarks; but that is in the possession only of a few, and is not a work of hasty reference.

I have divided the subject into different heads, and inserted from the best legal authorities what is directed by the law to be done in each case, the degree of criminality, and the punishment awaiting the offence committed. In offering this book for the perusal of Barristers, I presume not to interfere in their professional avocations, but to afford them an opportunity of knowing what ought to be done by medical men, in cases of violent death; the antidotes that should be employed when poison has been taken, the tests necessary for its manifestation, and the degree of confidence that is to be placed in them; the external marks occasioned on the body by the different means which cause death, and the usual internal appearances observed on dissection.

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* Elementa Medicinæ et Chirurgiæ Forensis.

A general acquaintance with this subject will enable them to examine medical witnesses more minutely, and detect ignorance or omission on their part, which may have stood in the way of their patient's recovery, or prevented the cause of his death being made apparent.

" Some acquaintance with this part of medical science must be useful at least, and sometimes necessary, to Judges and Lawyers. They will thus be enabled to estimate how much they may depend upon the opinion of any physician; and will know how to direct their questions so as to arrive at the truth, and avoid being misled by his partiality or favourite opinions. To the lawyer, who conducts the defence of an accused person in a criminal case, it is almost indispensable; without it, he cannot do justice to the cause of his client: and the duty of a Coroner in England consists almost entirely in deciding questions of juridical medicine:" *

The propriety of this remark must be apparent to every person who has been in the habit of witnessing the proceedings of our Courts, for Juries being selected at random from a mass of men infinitely large, must be presumed to be, and generally are, unacquainted with scientific enquiries, and cannot be supposed to understand the nicer distinctions of chemical research, which are often of great importance in establishing fact—the talent and learning of a Judge in explaining evidence, and directing them in their verdict, is therefore of the utmost im-

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* See review of Foderé's work in Edinburgh Medical and Surgical Journal, vol. i.

portance; from deficiency in this branch of science

> "I have seen,
> When, after execution, judgment hath
> Repented o'er his doom." SHAKSPEARE.

To Professor Duncan I acknowledge my obligation for the advantages I derived from his Lectures on Medical Jurisprudence, and have availed myself of my recollection of them, by introducing several of his valuable observations in this work. There are many voluminous and elaborate systems on juridical medicine by very eminent authors, as Metzger, Plenck, Zacchius, Mahon, Foderé, Schraud, &c. It has been noticed by Frank, Haller, Percival, and many others, whose works may be consulted with advantage. Many good observations are also scattered in various periodical publications. My object has been, not to enter too much into detail, and load my book with a suit of experiments, but to confine myself to results; extract from the best authorities those remarks which appear to be worthy the attention of my readers, and compress them into a form most convenient for speedy consultation; for in cases of poison, suspended animation, &c. there is no time for deliberate reference to diffusive authorities, and a loss of time is often a loss of life. A great part of these pages has been written some years, but, from consciousness of their deficiency, withheld from the press; the indignation, however, which has been excited by the perusal of the medical evidence adduced in some recent trials, has induced me to offer them to the public. I shall be happy, if they shall be found in any degree to prevent "those laws which were established by the integrity and wisdom of our ancestors, being injured by our folly, or perverted to an evil by our remissness."

ELEMENTS,

&c.

JURIDICAL MEDICINE.

JURIDICAL medicine has attracted but little interest in this country, although in Germany and France it has occupied the attention, and called forth the labour, of several of their most eminent medical philosophers. It consists in giving decisions on medical questions in Courts of Justice, and has therefore, in Germany, received a new and appropriate name, that of State Medicine. Distinct notice is taken of juridical medicine in the books of the law of Moses, in which it is commanded that the priests shall be desired to visit houses infected with the plague, or any contagious disease; the inhabitants are to be examined, quarantine established, the walls to be scraped and whitewashed, and the houses shut up, or, in bad cases, pulled down.*

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* Leviticus, chap. xiii, xiv.

The elders are to be consulted in cases of doubtful virginity,* &c. It is noticed also by the Roman law. But the first modern code in which it is mentioned, was made at the diet of Ratisbon in the year 1532, by Charles the Fifth, Emperor of Germany, called "Constitutio Criminalis Carolina;" in which it is enacted, that medical men shall be consulted when death has been occasioned by violent means, whether criminal or accidental, by wounds, poisons, hanging, or the like; and in cases of concealed pregnancy, procured abortion, child-murder, &c. which code still forms the basis of the criminal proceedings of the German courts. As their medical men in general are supposed, from inexperience, to be ignorant of judicial medicine, the Germans assign to each district, a surgeon who has made that subject his particular study, and he is called upon in all cases within his jurisdiction, to examine bodies and give testimony before the courts.

As early as the year 1650, physicians were consulted on this subject in Italy.* Their opinions are now required by the legislature of all civilized countries in these cases, and bear authority commensurate to the knowledge and respectability of the individuals by whom they are delivered. Professors to teach this branch of medicine are appointed in many universities, and its importance is more generally acknowledged; for, on the professional evidence of medical men, the fortune, honour, reputation, and lives of our fellow-citizens often depend. It is now considered a necessary part of medical education, and every practitioner of any branch of medicine or surgery should make himself acquainted with it, as his testimony may be required both in civil and criminal cases, and in consistorial courts, and will generally direct the jury in convicting or acquitting prisoners, in establishing the inheritance of property, and in confirming or annulling matrimonial contracts. When the services of a medical man are required in cases of this kind, he should note down correctly every circumstance that appears to be of the least importance. In cases of supposed murder, his evidence will be first required before the Coroner, who cannot act unless the body can be viewed, as it has formerly happened in several instances, that innocent persons have been convicted for supposed murders, committed on the bodies of those who have afterwards made their appearance.*

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* Deut. chap. xxii.

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* See Commentary on Beccaria's Essay on Crimes and Punishments.

The body should be examined by order, and *lawful warrant* of the Coroner, and by medical men appointed by him, and not by the direction of those who intend to become prosecutors. Testimony of the appearances observed on dissection thus privately conducted, ought to be received by a Jury with great caution, if the parties are in any degree interested in the result.

When a dead body is discovered in the fields, streets, or in the water, it must be removed to the nearest and most convenient house, but should not be taken out of the parish in which it is found. We should first ascertain, whether the body is really dead, and, if any spark of life remains, endeavour to call it into action. The situation in which the body lies, should be accurately observed, and that of the surrounding objects. The first question which arises is, whether the deceased died a natural or a violent death: if a natural death, what was the cause of it; if a violent death, was the violence committed on the spot where the body was found, or elsewhere, and the body carried there afterwards? Secondly, was it committed by himself or another? Thirdly, by what means was the violence committed? If the Coroner is at a distance, and cannot immediately attend, his consent should be obtained for immediate anatomical examination of the body, before putrefaction takes place; and from the state of it we should endeavour to ascertain how long the deceased has been dead; we should also inquire by whom he was last seen, and whether he has lately complained of, or was known to labour under, any disease. The inspection of the external parts of the body should be first entered upon, to ascertain whether there are any wounds, bruises, fractures, dislocations, or marks of violence of any kind; and if there is no evident cause of death, the internal parts should next be searched into; the integuments of the head should be carefully examined—the state of the cranium and sutures, and the colour and consistence of the brain observed, and the ventricles opened, to ascertain whether there is any serous or sanguineous effusion: the base of the cranium should be examined minutely, as a fracture sometimes exists there which may be easily overlooked. The mouth and throat should next be inspected; we should observe, whether there is any thing thrust into them, or if there are any appearances of inflammation or suppuration; for the bursting of an impost-hume in the throat may have caused suffocation. When the thorax is opened, we should observe whether there is any kind of effusion in its cavity, and whether the lungs are sound, as the bursting of a blood-vessel or vomica is frequently the cause of sudden death. The heart and large arteries should be minutely scrutinized; ossification of its valves or arteries, rupture or enlargement of its substance, or water in the pericardium, may destroy life suddenly. The stomach should be next opened, and its structure examined; and if there is reason to suspect that the deceased has been poisoned, not only its contents, but the matter which he has vomited, if any, should be collected, and chemically analysed. We should be careful to ascertain what time has elapsed since his death; for if the body has been dead several days, particularly in hot weather, and food or fluids are contained in the stomach, that, and the duodenum will often be found discoloured from incipient putrefaction, and the intestines inflated in such a manner as to induce the suspicion of inflammation where none has in reality existed. The other abdominal viscera, and the whole length of the intestinal canal should be traced, as it is possible that hernia, introsusception, or inflammation, may have been the cause of death; an empoisoned clyster may have been administered, or (as in the case of king Edward the Second) a hot poker or some other instrument thrust up the rectum. Where criminality is suspected, it is advisable that every viscus and cavity should be examined, even though at a distance from those parts whose injury is supposed to have been the cause of death; for the ingenuity of a Barrister, (and the acuteness with which examinations are conducted in our Courts is well known,) may invalidate the testimony of a medical witness unprepared to give an account of the healthy or diseased state of the *whole* body. From neglect in this particular, doubts have been thrown upon the cause of death, in some cases, which, whilst they have proved perplexing to a Jury, have fixed a stigma on the professional acumen of those whose business it was to have removed all doubts by dissection. The inspection should be undertaken in the presence of other surgeons, and the appearances noted down on the spot; and, however suspicious they may be, we should bear in mind the possibility of the same effects being produced by very different causes, and, where there is the least doubt, be careful that our evidence does not tend to attach suspicion to an innocent person. "To shed the blood of a fellow-creature is a matter which requires the greatest deliberation, and the fullest conviction of our own authority."* We ought to bear in our minds the maxim, that it is better that many guilty escape, than one innocent man suffer;* and when the evidence is not satisfactory and conclusive, we should deliver our testimony in favour of the suspected person; recollecting, at the same time, that however much a refined education and the habitual practice of benevolence may have softened our hearts and inclined us to lean to the side of mercy, we have a duty to perform to our country as well as to the accused, and should give our testimony with strict impartiality. A medical man should found his evidence solely on *demonstrative proof;* for his declaration, whether founded on experiment or not, is assumed by the jury as fact, merely on his authority as a professional man; "Medici non sunt propriè testes, sed est magis judicium quam testimonium;" and let a jury remember, that mere opinions are not facts; but, in the words of Shakspeare, " may be worn on both sides;" and the opinions of professional men of reputation are often diametrically opposite to each other, being drawn, not like the consequences of mathematicians, from infallible and incontrovertible axioms, but from those abstruse and recondite branches of science, which admit of little certainty, and open a wide door to fallacy and erroneous conclusions.

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* Three persons were hanged at Gloucester, in the year 1661, for the supposed murder of a man who was missing, but who afterwards returned. A similar circumstance happened at Warwick assizes, in the reign of James the First.

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* Sir W. Blackstone.

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* I am aware that this maxim is objected to by the late celebrated Archdeacon Paley: let, however, the reader peruse a work, entitled, "Considerations on the criminal Proceedings of this Country," and he will there see a dismal catalogue of innocent victims to circumstantial evidence, and allow, I think, that the maxim is not a bad one.

The taste or smell alone, ought to be cautiously admitted as evidence of the presence of poison; though, where vegetable poisons have been employed, it is sometimes difficult to adduce any other.* The attitude and marks on the body should be accurately noticed. There is recorded† the case of a woman who was found in bed with her throat cut, and a knife sticking in the floor near her: three of her relations were in an adjoining room, through which it was necessary to pass to the apartment of the deceased; the neighbours were alarmed, and the body was viewed: these relations declared she must have destroyed herself: but, from a particular circumstance, they were suspected, and found guilty of the murder; for, on the *left* hand, was observed the bloody mark of a *left* hand, which of course could not be that of the deceased.

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* See medical evidence on the trial of Mr. (commonly called Captain) Donellan, for the murder of Sir Theodosius Boughton.

† Hargrave's State Trials, vol. x. Appendix, p. 29.

When the body of an *unknown* person is found, with indisputable marks of having sustained violence, and the perpetrators remain undiscovered; after taking an accurate description of it, with the nature of the wounds, &c. the body must of course be committed to the grave, but the head should be preserved in spirits, in as natural a state as possible, that it may be recognized by the friends of the deceased, and thus become the means of bringing the delinquents to justice, for without this precaution a very important evidence may be destroyed: by these means testimony was furnished of the guilt of a woman and her accomplices, who suffered the punishment due to their crime, for the murder of her husband.*

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* Hargrave's State Trials.

Death is sometimes occasioned by causes which anatomy will not discover to us, as concussion of the brain, violent affections of the nerves, through the medium of the mind, aërial poisons, or extreme cold.

Sudden death, unoccasioned by the action of poisons or external violence, may arise from a variety of internal causes, affecting the different viscera and the sanguiferous system; as apoplexy, aneurism, ossification, syncope anginosa, ruptures of viscera, most of which may be discovered by dissection: there is, however, a disease, called by Mr. Chevalier* idiopathic asphyxia, where the person, without previous illness, faints and dies; no diseased appearances are observed on dissection, but the heart is found unusually flaccid, and its cavities entirely empty.

Consistency in medical evidence is very necessary: a glaring defect in this particular is observable in the trial of Mr. Donellan; the evidence in the indictment charges him with destroying Sir Theodosius Boughton by *arsenic*, nor is any other poison mentioned;

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* Medical and Chirurg. Transact. vol. i.

but in the trial he is charged with poisoning him by means of Laurel Water. The greater part of the evidence for the prosecution in this trial is of a very loose and unsatisfactory description.

CASES

WHICH COME BEFORE CRIMINAL COURTS AND CORONERS' INQUISITIONS.

POISONS.

Poison may be given feloniously, or taken accidentally: in the first case it is an offence of the deepest dye, and a most base and cowardly crime; this "revenge of cowards" is not so frequently committed in this as in some other countries, where poisoning is a trade. Lord Bacon says, "Non est nostri generis nec sanguinis."

By our laws it was formerly considered more heinous than any other murder, and by a statute of Henry VIII. was deemed high treason; and the punishment provided was, that the guilty person should be boiled to death, and put into the water toes downwards. A cook suffered this punishment for putting poison into food provided for the Bishop of Rochester's family, and the poor of the parish.* This law, however, was repealed in the next reign. The art of poisoning has never been carried so far in this country as in Italy, or has been deservedly forgotten. The Acqua Toffana, or Acquetta, and Pulvis successionis, with the composition of which we are in this country fortunately unacquainted, are said to destroy life in any given time, a week, a month, or year afterwards, according to the manner and quantity in which it is administered; but this, being contrary to the laws of nature, is no longer credited. Many have fallen sacrifices to this insidious treachery, when least expecting it. The Emperor Henry of Luxembourg received poison in the sacrament, and Pope Victor in the chalice. Pope Clement VII. is said to have been destroyed by the fume of a taper.† Dr. Mead says he was possessed of a composition, the vapour of which was so thin, that it was drawn by the current made by a burning candle, and would destroy a person who sat that way, but nobody else; its ingredients he has not thought proper to mention. Respecting the subtile action of these substances, many wonderful and incredible stories have been told. A priest is said to have offered to destroy Queen Elizabeth by poisoning her saddle.*

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* Hargrave's State Trials.

† Zacchius, Questiones Medico-legales.

Secret poisoning is of great antiquity, and is spoken of by Tacitus, † Theophrastus, ‡ Quintilian,¶ and other ancient authors. Plutarch says, that a poison was given to Aratus, "not of a sharp or violent kind, but such a one as causes lingering heats and a slight cough, and gradually brings the body to decay."‖ Locusta was the great professor of this diabolical art in ancient Rome, and Tophana more recently in Naples, who, with several others, was executed as late as the middle of the last century, and confessed she had been the means of destroying upwards of 600 persons.*

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* Sir Edward Coke, in the Trial of Sir John Hollis.

† Annal. lib. 4. c. 8.

‡ Hist. Plant. ix. c. 16. p. 189.

¶ Declamat. xvii.

‖ Life of Aratus.

The Biographer of Cyrus says, that in no place were more persons destroyed by poison than in Persia.†

La Chaussee was broke on the wheel at Paris in 1673, and his accomplice, the Marchioness de Brinvillier, a young woman of rank and beauty, was beheaded and burnt three years afterwards, for practising, according to their own confession, this occult art.‡ This crime never excited more attention than it did at this period, and a court was established in Paris, called *Chambre de Poison*, or *Chambre Ardente*, for the trial of offenders, many of whom suffered punishment. These compositions have been supposed to consist of arsenical salts, or small doses of corrosive sublimate, and the effects they produced justify that opinion. Another kind of slow poison is said to consist of opium and cantharides.¶

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* Hoffman Medicin. Rationalis.

† Xenophon, book vii.

‡ Voltaire's Age of Louis XIV. vol. ii.

¶ Abbè Gagliàni, cited by Professor Beckmann, in his History of Inventions, from which work I have quoted largely on this subject.

In 1521, a few days before the death of the Roman Pontiff, a monk was informed that an attempt would be made to poison him, not by his food, but by his linen: he soon afterwards sickened and died, exclaiming that he was poisoned; and the horrible frequency with which crimes of this nature were resorted to, is mentioned by all writers of that age.*

Notwithstanding the above cited authorities, the existence of this class of poisons has been doubted, and the peculiar powers which they have been supposed to possess of producing their lethal effects at a remote given period, previously calculated upon, have probably been exaggerated by vulgar credulity. The works of the French historians abound with ridiculous stories of the poisons and counter-poisons of Venice. The age of spells and philtres is passed away.

Poisons may be administered by the mouth; by the lungs, through the medium of the air; by the anus, in form of clyster; and by the skin, by means of ointments.

We derive them from the animal, vegetable, and mineral kingdoms. Mineral poisons are most commonly employed in Europe; they may act chemically or mechanically; most of them have a chemical action; but there are some, as diamond powder, cut hair, pounded glass, &c. which act mechanically. I shall not enter into a discussion respecting their modus operandi, as it is foreign to the plan of this work: it has long been a subject of dispute, and has been very ably treated by a variety of authors, and lately by Mr. Brodie. The aërial poisons are frequently the cause of death, but more commonly by accident than design.

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* Roscoe's Life of Leo X. vol. iv. chap. 23.

Poisons have been arranged in two classes, quick and slow, according to the rapidity with which they produce their peculiar effects, and are divided into two orders: first, stimulant and inflammatory; secondly narcotic and stupifying: these again have been formed into many subdivisions, which I shall not notice, as they are of no practical importance.

When we are called to a person who is *suspected* to have taken any deleterious substance, the first question which arises is, has he been poisoned? the second, by what particular poison? We should examine the food he has last taken, if any of it remain; and if no noxious ingredients of a mineral or vegetable kind can be detected in it, we should observe whether it has any peculiar smell or taste, and ascertain its effects, by giving a portion of it to a dog; but this is not to be depended upon, as what is injurious to one animal is not to another: aloes is said to be destructive to dogs and foxes, and sweet almonds to cats.* Corrosive sublimate, of which a few grains are highly prejudicial to man, may be given to horses, the quantity of an ounce, without occasioning death. † Dogs can bear with impunity a much larger dose of this substance than man. Many vegetables, which constitute the natural food of some animals, are destructive to others. We should examine whether the matters composing the food are wholesome in themselves. Grain, particularly rye, affected with a disease called by the French *ergot*, produces symptoms very similar to those occasioned by poison; viz. vomiting, purging, swelling of the body, and gangrene of the extremities.* Fresh wheat, affected with mildew, produces also baneful effects; and when the flour is very bad, it is said to excite pustules and boils on the hands of those who work the dough.† The seeds of the lolium temulentum, mixed with wheat, are productive of similar consequences, and if given to hogs, fowls, or other animals, prove destructive to them.

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* See Mahon, vol. ii. p. 502.

† See paper in the fifth volume of Edin. Med. and Surg. Journal, by Dr. Reeve, on the Effect of Oxymuriate of Mercury on Horses.

But we should distinguish from poisons those things which, from a peculiar idiosyncracy of constitution, produce on some persons violent effects, as strawberries, honey, salmon, shellfish, and a variety of other things, which occasion eruptions,‡ vomiting, purging, and symptoms of actual poison. The food may have consisted of deleterious vegetables, as different kinds of fungus, hemlock, &c. which are often mistaken for mushrooms, hedge-parsley, chervil, or other innocent herbs.

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* Hoffman, Mat. Med. vol. ii. chap. 9.

† M. Sage, Moyens de remédier aux Poisons, &c.

‡ Dr. Winterbottom says, he is subject to severe nettle-rash, after eating sweet almonds.—See Med. Facts and Observ. vol. v.

We should inquire whether the patient has been subject to periodical colic, or bilious vomiting or purging.

If a person has been poisoned by vegetable substances, we may often discover them in the stomach, or among the matter vomited. Seeds, half-digested fungi, leaves, &c. are sometimes found. We should be careful not to mistake the green colour of the bile, for copperas, or vegetable green. Persons eating the same kind of food, in the same quantity, may be differently affected: if the stomach is nearly full when it is taken, it is much less likely to cause death; for, being mixed with the food, it is thrown up by vomiting. The matter vomited should be collected in a clean earthen vessel, and examined; as, when a dissolved poison, or one easily soluble, has been taken, it is there that we are to expect to find it, and not in the stomach.*

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* See a paper on this subject, by Dr. Bostock, in the fifth vol. of Edin. Med. and Surg. Journal.

We should inquire into the previous state of the person's health, both bodily and mental; whether he has been taking medicines, and of what kind. In all cases of dubious or criminal poisoning, the body should be opened and examined in the presence of medical witnesses: the stomach should be tied at each orifice, and removed, that its contents may be subjected to chemical analysis: if sufficient cause of death does not appear in this organ, other parts of the body, particularly the brain, heart, and whole length of the intestinal canal, should be examined. Apoplexy, and other diseases of the brain, frequently affect the stomach and occasion vomiting; and the peculiar sympathy between the uterus and the stomach is well known. Introsusception of an intestine may exist, and have been the cause of death. Children sometimes die from the effects of this disease in a few hours; they are afflicted with colicy pains, violent irritation, vomiting, bloody stools, and convulsions.* Worms found alive in the stomachs of those supposed to have been poisoned, may perhaps be admitted a presumption to the contrary.

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* See Hamilton's Hints.

Unless all the different viscera are examined, a Jury should cautiously decide how far surgical evidence is to be deemed satisfactory and conclusive. We should be careful not to give an opinion that a person has been poisoned, without being able to produce irrefragable proof of the fact.

Froth issuing from the mouth, soon after death, is not peculiar to those dying by poison, but is often observed, particularly in cases of sudden death, and always in drowned persons. " It is the general effect," says Mr. J. Hunter, " of people dying in what may be called health: in an apoplexy, or epilepsy, in all sudden deaths, where the person was a moment before that in perfect health."*

The symptoms produced by poison are by no means uniform: convulsions, extreme pain, and other effects, which are mentioned as consequences, do not always exist; and, in forming an opinion, these facts should be taken into consideration.

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* Donellan's Trial.

It has been supposed that poison may be injected into the anus soon after death, for the purpose of bringing infamy and death upon an innocent person; and an instance is quoted by Orfila, from the proceedings of the Judicial Courts at Stockholm. In this case, according to the experiments of that Physician, it is found in the lower bowels only, and in a much larger quantity than when taken by the mouth. The inflammation, or erosion with which they may be affected, does not extend upwards, and a *distinct line* is observed between the sound and affected parts, which never exists in other cases.

If the noxious drug has been injected twenty-four hours after death, no redness or inflammation will be produced. If, with the above mentioned circumstances, fœces are found in the rectum, it is a strong presumption that it has been injected after death, as most deleterious substances capable of destroying life (except some of the vegetable poisons) occasion purging, when administered in the form of clyster.

It often happens, that, when called to a person who has taken any deleterious substance, we are unable to procure those remedies which are usually recommended in such cases: it should be remembered, that the great object is to dilute it, and remove it from the stomach as quickly as possible; this is to be effected by drinking plentifully of warm water or gruel, with which oil, soap, or mutton suet is mixed, tickling the throat with a feather, or the finger, so as to produce vomiting, or taking a quantity of mustard, which operates as a speedy emetic: if strong acids have been taken, to the above remedies should be added chalk, magnesia, or common potash, properly diluted.

ANIMAL POISONS.

The animal poisons of this country are few: those of hot climates not coming within the design of this work, I shall not speak of. The venom instilled into a wound, by the teeth of a mad dog, adder, or the stings of hornets, &c. produces its effects only by external application.

Hydrophobia is a disease of the most dreadful description; anxiety, uneasiness, languor, spasms, horror, disturbed sleep, difficult respiration, and loss of appetite, are the first symptoms, which gradually increase; violent convulsions and spasms of the whole body follow, hideously affecting the muscles of the face; sobbing, redness and protrusion of the eyes; the tongue is swelled, and sometimes hanging out: bilious vomiting, a viscid saliva flowing from the mouth, perpetual spitting, pain in the stomach, great impatience, a horror of fluids, and impossibility of drinking them, characterize this terrible disease. The unfortunate person often endeavours to spit upon and bite those about him. It is believed that, were he able to do so, he would not communicate the disease to the person bitten: and a case in confirmation of this opinion has lately been published in the transactions of the Medical Society of London. Mr. John Hunter, however, having wounded his hand in opening the body of a person who had died from the bite of a mad-dog, confessed his mind had been much harrassed, and in continual suspense for some time, conceiving it possible that he might be seized with symptoms of Hydrophobia.*

The remedies best adapted to prevent the bad effects which may arise from the bite of a mad dog, or the stings of venomous animals, are, washing the parts, and sucking out the poison; afterwards the application of the actual cautery, caustic, or (what is most to be relied upon) extirpating the parts with the knife. The wounded part should be made to bleed freely, and a purulent discharge kept up by means of stimulating ointments.

Hydrophobia is more easily prevented than cured. Mercury, arsenic, internally and externally applied, opium, musk, camphor, acids, wine, vegetable and mineral alkali, oil, various herbs, and many other remedies, whose effects are quite opposite, have been employed; and, though each has been supposed to be useful in particular cases, no one is to be relied upon. Large and repeated bloodletting, formerly recommended by Tissot, has lately been again brought into practice; and there are several cases recorded in the eighth volume of the

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* Home's Life of Hunter.

Edinburgh Medical and Surgical Journal, where it has been productive of beneficial effects. The blood should be drawn from a large orifice, and suffered to flow ad deliquium animi. The people of Tunis, when bitten by any venomous animal, after scarifying the wound, rub it with olive-oil, which they believe arrests the progress of the poison.*

Dissection.

On opening the body of a person who has died of hydrophobia, the tongue and fauces are sometimes found inflamed and swelled; and inflammatory appearances are observed in the brain, with serous effusion on its surface. The stomach is also inflamed, and there is an accumulation of blood in the lungs: but in some cases no morbid appearances whatever have been discovered.

The *Lytta vesicatoria*, or *Cantharis*, is sometimes administered as a medicine; but, when taken internally, either in substance, infusion, or tincture (except in a very small quantity), it occasions the most violent effects, as tenesmus, priapism, furor uterinus, involuntary pollution, bloody urine, strangury, violent pain, inflammation and ulceration of the stomach, bowels, bladder, and urethra; delirium, convulsions, and death. If the fly has been given in powder, it may probably be discovered, mixed with the ejected matter, or, after death, adhering to the coats of the stomach, and may be known by its peculiar green and gold colour; but, if given in form of tincture or infusion, we have no means of discovering it.

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* See Jackson on the Commerce of the Mediterranean.

I know only of one case where the Lytta has been given with a felonious intention, viz. that of Sir Thomas Overbury, who (on the confession of the person who administered it to him) is said to have taken it, mixed with his sauces. It has, however, been occasionally taken to goad the exertions of exhausted nature, and given to females with a view of accomplishing their seduction; and, when in too large a quantity, has produced the effects already mentioned. A mixture of opium and cantharides, in known doses, is said to be one of the Neapolitan slow poisons, the surest and most infallible.

Remedies.

The remedies to be applied are oil, milk, emollient drinks, as gruel, linseed-tea, drank plentifully, and thrown up by clyster; they may also be injected into the bladder, with probable advantage. The specific antidotal effects of camphor are not now credited.

VEGETABLE POISONS.

Vegetable poisons are divided into two classes, the *acrid* and the *narcotic.* The first occasion pain, inflammation, and erosion; the latter, sleep, stupor, and death; sometimes producing purging, vomiting, and convulsions. Several of them are, however, employed in medicine.

The effects of mineral are less simple than those of the generality of vegetable poisons; and when once an animal is affected by the former, there is much less chance of recovery than when he is affected by the latter.*

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* See Experiments and Observations on the Action of Poisons, by Mr. Brodie.

The poisonous vegetables found in this country are fortunately but few: those most commonly met with are ***Hyoscyamus*** (henbane), ***Cicuta virosa*** (water-hemlock), ***Atropa belladonna*** (deadly nightshade), ***Aconitum neomontanum*** (wolfsbane), ***Datura stramonium***, (thorn-apple), ***Digitalis purpurea*** (foxglove), ***Laurocerasus*** (common laurel), several of the tribe of fungi, and the juice of the poppy or opium. The effect of most of these is an impression on the nervous system, which, if considerable, frequently produces death.

Henbane is a most valuable medicine; but, when given in too large a quantity, becomes a very dangerous poison, occasioning stupor, symptoms of intoxication, apoplexy, or furious mania, extreme agitation, convulsions, sometimes vomiting, and remarkable dilatation of the pupils of the eyes, which become insensible to the stimulus of light.

Water-hemlock is one of the most deleterious plants Great Britain produces; it occasions convulsions and sudden death, but does not cause sickness, or any complaint in the stomach or bowels. The smell of it in a close room occasions giddiness and head-ache. The conium, or common hemlock, is by no means so poisonous as water-hemlock.

Wolfsbane, or *Monkshood*.* The leaves and root of this plant are violently poisonous when fresh, but not so much so when dried. They produce heat in the mouth, throat, and tongue, which gradually affects the whole body, occasioning spasm of the muscles, great debility, and giddiness; sometimes purging and vomiting succeed, followed by delirium and insensibility.

Deadly Nightshade. This is a most violent poison, the berries of which, having a beautiful and tempting appearance, are often eaten by children, and occasion the most fatal consequences. The effects produced by this plant are giddiness, difficulty of breathing, pain and tightness of the breast, distressing thirst, and dreadful ravings, fatuity, but not stupor; the jaws are frequently firmly closed, the eyes staring, the pupils dilated and insensible to light; universal agitation and trembling, particularly of the tongue, difficulty of swallowing, and unavailing efforts to vomit. "The body soon putrefies, swells remarkably, and is covered with livid spots—blood flows from the mouth, nose, and eyes, and the stench is unsufferable."*

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* From this plant, says Theophrastus, a poison may be prepared, so as to occasion death within a certain period, as two, three, or six months, for which no remedy has been discovered; on which account the people were forbidden to have the plant in their possession, under pain of capital punishment. *Hist. Plant.* ix. *c.* 16. *p.* 189.

Thorn-apple. The effects produced by this plant are giddiness, great terror, delirium, debility, stupor, and death.

Foxglove, administered in proper doses, is an excellent medicine: it is frequently taken by the lower class of society as a remedy for dropsical complaints, in form of infusion, without proportioning the dose to the activity of the medicine: when taken to the quantity of a few grains, it produces violent vomiting and purging, giddiness, delirium, hiccup, convulsion, and death. Every part of the above-mentioned plant is poisonous.

The roots of every species of ***Hellebore*** are poisonous, and produce vomiting, purging, and convulsions. It has been remarked that, after death, the rectum is always inflamed, although the other parts of the intestinal canal remain unaffected.*

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* See Edinburgh New Dispensatory, by Dr. Duncan, Jun.

Savine, which is sometimes used by women, for the purpose of procuring abortion, exerts a very strong action on the nervous system, the stomach and bowels. A gardener, who had chewed the tops of one of these plants, experienced a hot pungent sensation in his mouth: after a few hours the lips became swelled, and the muscles of the face were drawn on one side, having the appearance of a paralytic affection, which continued about a fortnight.

Different species of the order of fungi, particularly the agaricus muscarius, or bug-agaric, and the fungus piperatus albus, or pepper-agaric, possess a deleterious quality, and produce swelling of the body, delirium, sickness, and great pain, succeeded by vomiting, purging, cramps, and convulsions. When eaten in small quantity they have an inebriating effect. We are informed by Haller, that the Russians eat almost every species, even those which other nations esteem the most dangerous.[*]

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* Orfila, tome ii.

The leaves of *Laurel*, distilled with water, become a very quick poison. A tincture or decoction would probably have the same effect. This poison was not known till the year 1728, when it was accidentally discovered in Ireland, and an account of it published in the Philosophical Transactions.[†] When two or three times distilled with fresh leaves, a heavy essential oil comes over, which, by shaking, becomes incorporated with the water. Two ounces of this killed a middle-sized dog in less than half a minute, even while it was passing down the throat.[‡] The smell of laurel-water is similar to that of bitter almonds, from which, by distillation, a poison is extracted, similar to the laurel in its effects. When laurel-water is given in smaller quantity, it produces sudden and violent convulsions resembling epilepsy, paralysis, and death.

From the experiments of Dr. Browne Languish, it appears that, if laurel-water be given to a dog, in gradually increased doses, mixed with his food, he will be enabled to bear as much as four or five ounces, without sustaining injury; but, if one ounce, undiluted, be poured upon an empty stomach, it will occasion violent convulsions and death.* By the same authority, it appears that laurel-leaves, beaten into a pulp, have a deleterious effect upon animals; but it is a curious fact, that the strongest decoctions, or infusions of them, have no effect upon horses, even when given to the quantity of a pailful.†

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[*] Haller, Helvet. Hist.

[†] Vid. Philosophical Transactions, vol. xxxvii.

[‡] See Fontana on Poisons.

The only instance on record of a person being tried on suspicion of having unlawfully administered this poison, is that of Mr. Donellan, at Warwick, in the year 1781.

The essential oil of bitter almonds is the most speedily fatal of any poison we have: the smallest quantity inserted in a wound causes death.

Opium is injurious to some constitutions in very small doses; others, from habit, are enabled to bear considerable quantities, without sustaining inconvenience from it. When administered in a large dose, to a person not accustomed to it, it generally produces vomiting, whereby its fatal effects are often counteracted; but, if this does not take place, giddiness, nausea, intoxication, delirium, and stupor succeed, terminating in death.

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* Experiments on Brutes.

† Dr. Reeve in Edinburgh Med. Journal, vol. v.

A case is recorded by Dr. Marcet, in the first volume of the Medico-chirurgical Transactions, where six ounces of laudanum were taken by a man, and remained in his stomach five hours before any remedies were applied for its removal: he, however, by perseverance in judicious treatment, eventually recovered.

Opium and laudanum are not unfrequently sold by druggists, by mistake, for other substances of similar appearance.

Remedies.

The remedies for henbane, hemlock, nightshade, wolfsbane, thorn-apple, poisonous mushrooms, and opium, are active emetics, as sulphate of zinc or copper, ipecacuanha,* in doses of one or two drachms, infused in water; purgatives, strong infusion of mustard, clysters, alkaline salts, oil or milk drank plentifully, blisters to the stomach, and strong vinegar,* in large quantities, particularly when thorn-apple or opium have been taken: to counteract the effect of the latter, strong coffee has been recommended, and the person should be moved about and agitated, to prevent his sleeping; a strong solution of ammonia is justly considered an excellent antidote to all the narcotic poisons. Bleeding has been advised, but should never be resorted to till

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* Large doses of this substance are more certain in their operation, but not proportionally more violent than small

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ones, and do not occasion the debility or irritation in the stomach, which is the consequence of metallic emetics.

* Since the first edition of this work was published, M. Orfila has given to the world the second volume of his *Traité des Poisons*, and from experiments made on dogs, concludes, that acids, instead of being antidotal to opium, actually render it more fatal, by hastening its solution, and facilitating its absorption into the system; but when the poison has been ejected from the stomach, acids may be advantageously employed to remove its effects. When opium, therefore, has been swallowed, an emetic should be first given, and afterwards vegetable acids, and a strong infusion of coffee (which is preferable to the decoction) repeated at intervals till the recovery is complete.

the pulse becomes full, and there is danger of fever supervening; but in plethoric persons, or where there is an apoplectic appearance, it will be highly serviceable; acids are recommended, but should not be given till the opium has been ejected from the stomach, as it has been found to dissolve it, and render it more active. Blisters applied to the stomach will probably be useful in all cases of vegetable poison. As the effects of very large doses of opium are decidedly sedative, brandy and water, and other stimulants, should be given after the poison has been removed from the stomach. Æther has been recommended as powerfully antidotal to poisonous fungi. When *Foxglove* has been taken in too large a quantity, brandy and water, to which some spirit of horseradish or ammonia, or other stimulating cordials are added, should be administered, and blisters applied to the stomach. The antidotes to *Laurel-water* are, alkaline salts, and other stimulants. The spirit of ammonia, largely diluted with water, should be forced down the throat to the extent of two or three drachms.

Dissection.

The bodies of those who have been destroyed by vegetable poisons, generally swell prodigiously, soon become offensive, and covered with livid gangrenous spots.

On opening the body, the viscera are usually found in a sound state, but the veins are full and distended, the blood remarkably fluid, and the arteries empty;* but when the deadly nightshade has been the cause of death, the intestines are inflated and inflamed, or corroded and gangrenous.†

The *Prussic acid*, existing in a natural state in bitter almonds, the kernels of apricots, the leaves of laurel, and peach blossoms, from which it may be extracted by distillation, may, perhaps, most properly be classed among the vegetable poisons, although, as it is artificially obtained by the decomposition of animal substances, it is generally deemed an animal acid:

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* See Fontana on Poisons: Orfila, however, asserts that the blood is frequently coagulated a short time after death.

† Edin. Dispensatory, by Dr. Duncan, junr.

it has a sweetish taste, smells like bitter almonds, and has lately been discovered to be poisonous. Hufeland mentions an instance of one who destroyed himself with it: another occurred in the person of Professor Scharinger, of Vienna, who died in consequence of applying it to his naked arm; and a third is quoted by Orfila, from the Annales de Chemie, for October 1814, of a girl who fell dead, as if struck by apoplexy, in consequence of swallowing a small quantity of it.

This substance produces the same effects on the animal system as laurel water, and the remedies are similar. In what does the difference between these two poisons consist, or are they not the same? M. Virey has proposed as an antidote, the sulphate of iron, having observed its effects on a cow which was nearly destroyed by the Prussic acid.

To the above catalogue of poisons may be added the aroma of certain plants and flowers, as the lily, mignionet, saffron, &c. which are said to have produced asphyxia, and even death.

A *strong* infusion of tobacco, given as a clyster, is poisonous and occasions speedy death; two or three drops of the essential oil of this plant, taken by the mouth, are instantly fatal.

There are other plants, as the arum, the yellow lily, the squill, meadow-saffron, &c. which, when taken in considerable quantity, cause vomiting and other severe effects. The juice of the veratrum album, applied to a wound is said to occasion convulsion and death; and the powder of it, so applied, violently affects the stomach and bowels; taken internally, it proves a strong emetic, occasioning severe convulsions and other bad effects.

There are a vast number of animal and vegetable substances, the product of India and America, which are highly deleterious; to treat of them, would be foreign to the object of this work. Some are of so poisonous a nature, that the smallest quantity will occasion death, as the Ticunas, the Accawaw, and the Caruna,* the hundreth part of a grain of which, infused into a wound, will kill a small animal. A maggot bred in the putrid milk of the Jatropha Manihot, is so potent, that the smallest quantity infused in drink is sufficient to destroy life, and is said to be occasionally employed for that purpose by Africans and Negroes.*

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* Bancroft's Guiana, pp. 98, 266, 288.

MINERAL POISONS.

The metallic and mineral poisons are lead, copper, arsenic, orpiment, mercury, antimony, silver, barytes, metallic fumes, and the mineral acids. These substances are not poisonous in their metallic state, but become so when united with acids.

LEAD.

Lead is found in the shops, in the state of red and white oxide and litharge, and its action is greatly increased by union with acids: it is used in medicine both externally and internally. As internal remedies in cases of inflammation, sprains, contusions, &c. the preparations of lead are very valuable; but their application is not altogether unattended with danger, particularly when applied in the form of poultice to ulcers and open wounds: there are several cases recorded, in which colic, and slight paralytic affections, have been occasioned by their use.* Dr. Percival says, he has been assured, from undoubted authority, that a gentleman had a slight paralytic affection from putting his feet every evening on a piece of lead near the fire, and that his dog lost the use of his limbs by lying upon it.

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* See Long's Hist. of Jamaica, vol. iii. p. 781.

Preparations of lead have been given internally in small doses, in cases of ulcer of the bladder, vomiting of blood, and other diseases, in which astringent and styptic remedies are required; but they should be administered with great caution, as the most dangerous effects may result from their use. Lead is classed among the slow poisons: it is seldom or never given with the intention of poisoning, but is received into the body mixed with our aliment, or dissolved in wines. Any acid or fermenting substance, kept in vessels lined or glazed with lead, will dissolve a portion of it; and thus we may be taking in a slow but certain poison, and experience all its dreadful effects without suspecting the cause. Delicate people and children are affected by the smell of paint, and there are instances of their having the colic from sleeping in a recently painted room.

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* Med. Essays.

Lead is destructive to animal and vegetable life. Plants set in pots of this metal do not thrive, and poultry fed in troughs lined with it, pine and die. It was formerly a common custom to sweeten cider and acid wines, by suspending a ball of lead in the centre of the cask; and to such a pitch had this dangerous art arrived in Germany and France, that its practice was made a capital offence. As lead unites very readily with oils, the acetate or sugar of lead has been much used in Holland, to correct the more offensive expressed oils, and make them resemble oil of olives or almonds. The fumes of lead are equally deleterious; plumbers and painters exposed to them, have a pallid countenance, and often experience their baneful effects.

In the white lead manufactories workmen are sometimes affected in a week or two, sometimes not for months, or even years; the most prejudicial part of the operation is the sifting or separating the metallic part; this, however, is not so prejudicial as formerly, as it is at present conducted under water, which prevents the particles of the white lead being diffused in the air.*

Lead sometimes produces only a slow lingering indisposition, which at length terminates fatally; and it is probable some of the slow poisons used by the ancients, and by the Italians, were composed of some preparation of this metal. Lead is often taken into the body in considerable quantity dissolved in water, which has run through leaden pipes, or stood in cisterns of that metal. Dr. Thomson has observed, that the Thames water, at London, which contains a large quantity of animal matter of every description, never contains lead in solution, although allowed to flow through leaden pipes, animal matter having the property of combining with this metal and forming an insoluble precipitate.† A portion of the cylinder of the pump* may be dissolved in it, particularly where the water is hard, and contains neutral salts, which are occasionally present in it: lead is soluble even in distilled water, if it contains air;† but sulphuric acid has no action on it. Perry, cider, wines, or rum, made in leaden vessels, dissolve a large quantity of it, and occasion the disease called the colic of Poictou and Devonshire, and the dry belly-ache of the West Indies. Some of our older cookery-books direct lead to be put into wines, to prevent their turning sour; but as its pernicious effects are better known in the present age than formerly, it is to be hoped this is now never practised. It has been supposed that since the introduction of beer-machines into general use in public houses, paralytic affections and sudden deaths, where no morbid affections can be discovered on dissection, are more common than formerly: these machines are also used in some places to draw cider, which, dissolving a portion of the leaden pipes through which it passes, is rendered extremely pernicious. Wafers are often coloured with red lead, and if picked up by birds prove poisonous to them. A case occurred lately in London, where, in a family, consisting of nine persons, four died from using sugar kept in a cask which had formerly contained white lead, and not been properly cleaned.

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* Willan's Reports on the Diseases of London, p. 274.

† Observations on the Water with which Tunbridge is supplied for domestic purposes.

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* See Fothergill on the Poison of Lead, and Dr. Lambe.

† Henry's Elements of Chemistry.

Effects.

The effects produced by lead are, colic, tremors, languor, asthma, palsy, convulsion, and death, which is sometimes sudden, attended with convulsions.*

According to the observations of Dr. Heberden, the poison of lead seems to affect the nerves, yet is seldom or never found to impair the understanding, or make the patient delirious; Dr. Willan, however, says, " when the poison has pervaded the whole constitution, the patient becomes torpid and insensible, as in lethargy; others die in a state of phrenzy and violent delirium."* Cats become delirious from swallowing it.†

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* See first volume of the Transactions of the Medical Society of London.

Remedies.

The remedies to be applied, are opium—when there is much pain or spasm, the warm bath, laxatives, particularly sulphate of magnesia, or castor oil, purgative clysters, &c. and gentle emetics; when the body is open, the hydrosulphuret of potash or ammonia, or the sulphuret of potash, should be given, largely diluted with barley-water or water-gruel; or common flowers of sulphur may be taken in any agreeable form, followed by as large a quantity of a diluted alkali as the stomach can bear.

On opening the body of a person who has died from taking this metal, no morbid appearances whatever are discovered which can be supposed to arise from its action.‡

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* Reports on the Diseases of London, p. 274.

† See Percival's Essays.

‡ Transact. of Med. Society of London.

Tests.

Sulphuretted hydrogen gas, and alkaline hydrosulphurets, are very delicate tests, and, added to liquor containing lead, give a blackish precipitate; but their use requires great precaution, as they give a dark precipitate when tin, silver, iron, and other metals are present, which might be very readily mistaken for lead. Sulphuret of ammonia, or potash, produce a similar effect. Dr. Lambe, however, has discovered lead in water by other methods of operating, where these have failed.* Dr. Hahnman's test for discovering lead in wines is a very good one; it consists in putting into a phial sixteen grains of sulphuret of lime, prepared in the dry way, and twenty grains of acidulous tartrite of potash, or cream of tartar; the phial is to be filled with distilled water, and shaken for ten minutes, the clear liquor decanted and kept in a well-stopped bottle for use: this, when fresh prepared, gives a dark-coloured precipitate if lead is present.

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* See his Researches into the Properties of Spring Water.

If, on the addition of a solution of the sulphate of soda or potash, to suspected fluids, a precipitate occurs, we may conclude they contain lead; these tests produce a white precipitate in water, containing one hundred thousandth of its weight of lead, and are justly considered by Dr. Thomson as the most unequivocal reagents of that metal which we possess:—"the precipitate is a fine dense powder, which speedily falls to the bottom, and is not redissolved by nitric acid, no other precipitate can be confounded with it, except sulphate of barytes, and there is no chance of the presence of barytes in solution in water;"* but the most satisfactory method where the precipitate is in sufficient quantity, is to collect and submit it to the action of heat, in a crucible, or by means of a blow-pipe, when it will be reduced to its metallic state.

COPPER.

The preparations of this metal, most commonly used, are the subacetite, or verdigris;

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* Observations on the Water with which Tunbridge is supplied for domestic purposes.

the rust, or green oxide; the sulphate, or blue vitriol: and the ammoniate of copper. Their effects, though different, are, when improperly taken, not less deleterious than those of lead, yet, when judiciously prescribed, they are valuable, both as external and internal remedies. The metal itself, when swallowed, is poisonous; and several persons have died from swallowing a button or a halfpenny. When received internally in considerable quantities, it produces thirst, pain in the stomach and sides, restlessness, sometimes a rash on the surface of the body;* frequent and small pulse, violent purging, vomiting and retching, hiccup, delirium, fainting, convulsions, inflammation of the stomach, and death. The nitrated copper is more violent in its action, than any other preparation of this metal. Copper is seldom wilfully administered as a poison, as its taste is so styptic and disagreeable, that, unless mixed with some savoury viand, or its stronger salts given in the form of pills, it could scarcely be swallowed in large quantities: there are many instances of persons having taken it in their food; and that which happened in 1773, at Salt Hill, is still well remembered. The poisonous fish caught in the West Indies are supposed to derive this quality from copper obtained from the ore of that metal existing in the banks on which they feed. It does not kill so speedily as arsenic or corrosive sublimate. Pickles, and other vegetables, are sometimes prepared in copper vessels, to give them a fine green colour. Cider, wines, vinegar, &c. are often impregnated with this metal by running through brass cocks. The acetate of copper, or verdigris, is the form in which it is most commonly received into the body. A solution of common salt in water, boiled in a copper kettle, dissolves a considerable quantity of the metal, but it is an extraordinary fact, that when salt meat, or fish, are boiled in copper vessels, the water in which they have been immersed does not contain a particle of copper.*

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* See Percival's Essays.

Remedies.

When this poison has been taken, if it does not produce speedy vomiting (which a very small quantity in any state generally will), twenty grains of sulphate of zinc, or white vitriol, should be given immediately, in warm water, and as large a quantity of diluents drank, as milk, linseed-tea, &c. as the stomach will contain.

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* Orfila.

Calcined magnesia in considerable doses, a diluted alkaline salt, as potash or ammonia, mixed with water-gruel, &c. should be administered. Mutton suet, dissolved in gruel, being often more easily procured than oil, and less nauseous and more inviscating, should be taken in large quantities. It may also be thrown up in the form of clyster. Artificers in copper and brass have a notion, founded on experience, that those who take milk daily are the least affected by these deleterious metals. Milk, therefore, should be given in large quantities, and as it is known to contain albumen, may be considered one of the best antidotes. In case the best remedies cannot be procured, which often happens, a quantity of soap, pearl-ashes, chalk, or common wood ashes, strained through linen, may be dissolved in water and taken: the same may be administered in form of clyster. When halfpence or buttons have been swallowed, large doses of castor-oil should be given, and all acids carefully avoided.

Sugar and syrups have been considered the best antidotes to virdigris; but M. Orfila prefers albumen, which he deems the most powerful counter-poison, to all the cupreous salts.*

Appearances on Dissection.

When the body of a person who has been poisoned by copper is submitted to dissection, inflammation will sometimes be observed in the brain; but this is not an universal effect. The stomach and intestines will be found inflamed and corroded, and the same appearance exhibited as is produced by other acrid poisons.

Tests.

If it be a liquor that is suspected to contain copper, the addition of a solution of pure ammonia, in quantity more than sufficient to saturate the acid, will strike a beautiful blue colour.

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* Traité des Poisons, tome ii. partie 2. p. 211.

Infusion of nutgalls precipitates copper of a green colour, afterwards becoming red.

If the quantity contained in the fluid be very small, it may be concentrated by evaporation. If pickles or made dishes are suspected to contain this metal, a part should be mixed with pure water and well agitated, and the water decanted off, and treated in the same manner; if the minutest particle of copper be in solution, the ammonia will assume a blue colour. But the test most to be relied upon, is a piece of well-polished iron, as the blade of a knife, immersed for a short time in the liquid, which, if copper be present, will receive a cupreous crust.

ARSENIC.

The sale of arsenic is restricted in France, and should be subject to similar prescription in this country. The different forms in which this metal is found in the shops, are those of white oxide, orpiment, and realgar: the two latter are combinations of the metal with sulphur. In whatever form it is taken into the body, it is extremely deleterious. It is used in the manufacture of pigments, glass, and a variety of other arts. It did not compose any of the poisons of the ancients, as it was unknown to them in its most corrosive form. The white oxide, or arsenious acid is most commonly employed as a poison: it is a brittle substance, easily reducible to a powder. It is not very soluble in water, which, at the ordinary temperature takes up only one eightieth; but, according to La Grange, it is soluble in one twenty-fourth of cold water, and one fifteenth of hot.

Arsenic, in solution, is frequently prescribed by physicians for the cure of diseases, with manifest advantage, as in intermittent fevers, periodical head-ache, cancers, leprous diseases, &c. and has often proved serviceable when every other medicine has failed. It has lately been considered a specific against the effects of the bites of venemous snakes in the East Indies.* In the solid state it is seldom administered medicinally, as a very small quantity is productive of dangerous consequences. It is a quick poison to plants, and has generally been considered poisonous to all animals; but, according to Dr. Parr, a horse will take a drachm without injury, and his coat and condition be improved by it.* It occasions a sense of heat in the tongue and throat, nausea, and sickness, followed in about half an hour by violent vomiting and purging of watery viscid matter, sometimes of blood, generally pain in the stomach and bowels, hiccup, spasms, thirst, cold sweats, extreme coldness of the whole body, particularly the extremities, fainting, and death. Delirium, or loss of reason, is seldom a consequence of it; and the unfortunate person is conscious till a few moments before the termination of his existence. After some time, these symptoms cease, the abdomen becomes tender to the touch, the pulse imperceptible; and with the sensation of faintness, exhaustion, and tendency to sleep, which may continue many hours, he expires: these symptoms took place in a case I attended, where a tea-spoonful of alum and arsenic had been taken, in the proportion of one-third of the former to two of the latter, which, by the negligence of a druggist's servant, had been sold for magnesia. If the patient recovers, he is often affected with epileptic fits for some time afterwards.

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* See Med. Chirurg. Transact. vol. ii.

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* See Med. Dictionary.

There are on record, cases where nausea and faintness, followed by speedy dissolution, have been the only symptoms; others, where only vomiting and purging* have been observed; and where there are no proofs or suspicion of arsenic having been taken, it would be very difficult to distinguish the case from cholera morbus.

These are the general symptoms produced by arsenic, but they are by no means uniform; and even although they should all take place, a medical man is not authorized to declare, that death has been occasioned by poison, unless he can actually discover it in the body, or among the matter ejected, which should always be carefully examined.† Arsenic applied ex-

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[*] Case by Dr. Yellowly, in the 5th vol. of Edin. Med. and Surg. Journal; and M. Renault, sur les Contre-poisons.

[†] In the case of Mr. Donellan a medical witness swore, that Sir Theodosius Boughton was poisoned by *arsenic;* af-

ternally to sores, or bleeding wounds, in form of ointment, will occasion death.* A paste made of arsenic is sometimes used by the French surgeons for the cure of cancers and obstinate sores. One of them mentions an instance of its application proving fatal; the day after it was applied, the patient complained of colic and severe vomiting, and in two days died in painful convulsions;† the body quickly putrefied; the internal coat of the stomach, and great part of the intestinal canal, were inflamed, and marked with

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terwards, that he was destroyed by *laurel-water,* although it was not proved that the deceased was poisoned, or even that any poison had existed. Mr. Hunter declared, that all the symptoms might arise from apoplexy, or epilepsy, and that the appearances on dissection explained nothing but putrefaction, yet this unfortunate man was executed: from such kind of evidence as this, it is but too probable, that many persons have suffered unjustly.

[*] See review of Dr. Jaeger's Thesis de Effectibus Arsenici, in the 7th vol. Edin. Med. Journal, and 5th vol. London Journal.

[†] Roux, Nouveaux Elemens de Médecine operatoire, tome i. p. 62.

dark spots. Two instances are recorded, one in the acts of the Society of Medicine of Copenhagen, the other in the *Journal de Médécine*, of women who were destroyed in consequence of the introduction, by their husbands, of this substance into the vagina, in form of powder.

The quantity of arsenic necessary to destroy life, depends upon the form in which it is given, and the state of the health of the person to whom it is administered. A larger quantity may be given chemically dissolved, than in the solid state; but a very few grains are in general sufficient to have a fatal effect. It is probable that some persons are able to bear a much larger quantity than others. That the stomach will sustain greater injury than is generally believed, is proved by the fact of a man having lived several days after swallowing a quantity of melted lead; and, from experiments made on dogs and fowls by Mr. Spry, it appears that, after having melted lead, to the quantity of several ounces, poured down their throats, they survived, and did not appear to be materially injured. The result of the above experiments, though almost incredible, is confirmed by Dr. Huxham.*

The time that is required to kill by arsenic, also varies. I have seen a case, which terminated fatally in four hours; and another, where the person lived seventy-eight hours after taking it. It does not act chemically, as a caustic, either on living or dead animal matter. I have reason to think that the long protracted and injudicious use of this mineral internally induces exostosis and caries of the bones.

Remedies.

There is no antidote, properly so called, which can be at all depended upon, to counteract the effects of arsenic. The sulphuret of potash was first recommended about thirty years ago, by M. Navier, physician to the King of France, and has been frequently employed; but is a very doubtful remedy. It has no action on arsenic in the solid form, in which it is generally taken; and, though frequently recommended, is probably inefficacious; it has at least been found so by M. Renault, a French physician, who has made many experiments on this subject. Water impregnated with sulphuretted hydrogen, is a better remedy, and when the arsenic is taken in solution, or in form of arsenious acid, has considerable efficacy.* Alkaline salts are still more efficacious; they act upon the oxide of arsenic much more speedily than acids. An ounce of subcarbonate of potash, or prepared kali, dissolved in three or four quarts of warm water or gruel, should be speedily taken, or the liquor potassæ or ammoniæ, mixed with gruel or linseed-tea, should be taken in the same manner. These, as chemical remedies, are the most likely to afford relief; if they cannot be had, sulphur, wood-ashes, or soap, dissolved in water, chalk, or lime-water, should be taken in large quantities. The two latter have been found, by experiment, to have considerable effect in preventing the deleterious action of an over-dose of this poison. Acids have generally been considered injurious; but they are recommended by M. Sage as useful against mineral poisons, though they have very little action on arsenic, except when assisted by heat.

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* See Philosophical Transactions, vol. xlix.

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* Vide Nouvelles Expériences sur les Contre-poisons de l'Arsenic, par M. Renault.

M. Bertrand, a French physician, recommends charcoal as a powerful antidote to the poisonous effects of arsenic and oxymuriate of mercury, or corrosive sublimate. He gave six grains of these poisons to several dogs, mixed with charcoal, and no injury was sustained by them; to others he gave the poison alone, and when violent vomiting, and other deleterious effects, had taken place, he arrested their progress by giving charcoal, suspended in some fluid. He himself even swallowed, at one time, four grains of corrosive sublimate, and at another five grains of arsenic, mixed with charcoal, without sustaining any injury.* This, however, is by no means to be depended upon, and its antidotal effects are very doubtful.

The plan of treatment on which we are most to depend, is the administration of those remedies best calculated to remove the poison from the stomach. If vomiting has not taken place, an emetic of sulphate of zinc, or ipecacuanha should be given, and as large a quantity of milk, sugared-water, gruel, or other diluents, drank as can be got down. Oil and mutton suet, mixed with gruel or water, have been recommended. Oily substances are objected to by M. Sage; and it is the opinion of Fourcroy and Renault, that arsenic, mixed with oil, butter, or fat, will kill sooner than when given in an aqueous vehicle; castor oil, in large doses is, however, a very useful and proper remedy.

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* See Journal de Médecine, Dec. 1813.

Milk has been supposed, by M. Navier, to have a peculiar efficacy in dissolving arsenic. As the only well-founded hope of saving the patient depends on the evacuation of the poison, proper means must be persisted in, till there is reason to believe that this object has been effected. A sponge, attached to a flexible catheter, and introduced into the stomach, would probably bring up a quantity of the arsenic, which adheres to the superabundant mucus lining the stomach. When it appears that the poison has been removed, mild nutritive fluids should be given, and a blister applied to the region of the stomach; and, if the *pulse* *and other symptoms will admit of it*, blood may be taken from the arm, and the case treated as idiopathic gastritis;* but where the debility is great, it will require the treatment proper for cholera morbus. The body should be kept open by castor-oil and clysters, and all irritants avoided.

Dissection.

On examining the bodies of persons who have been destroyed by arsenic, the appearances will not be found uniform, but vary very much in different cases. The body is sometimes swelled and livid, but more frequently natural; swelling is more commonly the effect of vegetable poisons: ulcers and blotches have been seen on the surface, but this is the effect of re-action, and probably are never observed when death has taken place within a few hours after the poison has been taken; nor is putrefaction hastened or retarded by it, although both accelerated and retarded putrefaction have been enumerated among the proofs of death by arsenic.* The vessels of the brain are sometimes found distended with blood. The pharynx and œsophagus are generally in the natural state, but the stomach and intestines are almost always inflamed, abraded, or eroded: the villous coat is chiefly the seat of the inflammation, but the peritoneal coat is not very frequently affected: the colon is often contracted and corrugated in a singular manner. The action of the arsenic produces a remarkable secretion of glairy mucus from the mucous membrane of the stomach, to which (if it has been taken in the solid form) small pieces will be found adhering. The inflammation produced on this organ by arsenic, is greater than by any other poison;† it has an ecchymosed appearance, often of a dark red colour, in spots or streaks, somewhat resembling the sides of a boiled lobster. Erosion of the stomach from this cause is seldom seen; "there are few stomachs," says Mr. J. Hunter,

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* See a case in the Medico-chirurg. Transactions, so treated by Dr. Roget, vol. ii.

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* From the Experiments of Professor Kelch, of Konigsburgh, it would appear that arsenic has an antiseptic power. See Hufeland's Journal, vol. xix. and xxii.

† Mr. Brodie's Experiments on the Action of Poisons.

"which are not at the great end, in some degree, digested after death;" but these instances have occurred almost only in those persons who, while in good health, have died suddenly from accident, apoplexy, hanging, or the like. Mr. Hunter is the only writer, (Mr. Burns excepted*) who has observed these appearances, which, notwithstanding his high authority, seem to require the corroborative testimony of other anatomists. Dr. Baillie admits, that they are seldom strongly marked, and very rarely take place at all.† It is possible a case of this kind might be mistaken for the effect of poison.

I have been present at the dissection of a woman, who took a quarter of a pound of arsenic, in coarse powder, which killed her in four hours; but there was no erosion; nor should erosion alone, if discovered, be deemed a proof of poison having been taken: it may be the effect of suppuration. There are several cases on record, where this organ exhibited extensive erosions and ulcerations, when it was certain that they could not be the effect of poison. A case of this kind occurred to me about twelve years ago, and is published, with a drawing, in the thirteenth volume of the London Medical and Physical Journal. The preparation is in the possession of Mr. G. Freer. Dr. Baillie, Professor Chaussier,* M. Renault, and others, have recorded similar cases. The latter author mentions a case, where the arsenic was swallowed in large pieces, which produced no other effect than slight syncope on the approach of death. On opening the body, the arsenic was found in the state it was swallowed; but there was neither inflammation nor erosion of the stomach. Dr. Baillie and Dr. Yellowly have found the stomach thickened in several parts, as if by coagulable lymph, and in one case a thickening of the coats was the only alteration of structure observable. The stomach is generally found nearly empty; its contents consisting only of mucus and extravasated blood, to which the solid arsenic, as before mentioned, is found adhering; but if the poison has been taken in the fluid state, no evidence of its existence will be found in the stomach: this must be sought for by chemical tests among the matter ejected by vomiting, which should be *always carefully* preserved. The blood is usually found fluid in the heart and blood-vessels.* Mortification of the pudenda is said to be an effect peculiar to the action of arsenic:† and Dr. Baillie observes that, in several instances, a mortification of the rectum has been observed as a consequence of this poison.‡ I have, in several cases, found the rectum abraded and ulcerated, and more inflamed than the stomach itself.

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* Edin. Med. and Chirurg. Journal, vol. vi.

† Morb. Anat. p. 152.

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* Gazette de Sante, 11 Decembre, 1815.

Mr. Brodie, in his experiments on animals, found the inflammation greatest in the stomach and rectum, but has never seen ulceration in either. The larger intestines are sometimes thickened and corrugated, but are seldom found to contain arsenic, unless the quantity taken is very large.

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* Brodie's Experiments.

† Prestwich on Poisons.

‡ Morbid Anatomy.—Dr. Addington, in his evidence at the trial of Mary Blandy, for poisoning her father by arsenic, stated, that the anus was very painful, and surrounded with excoriations and ulcers. See also a case in vol. xxviii. of the Med. and Physical Journal, p. 345.

Tests.

There are a variety of means of ascertaining the presence of arsenic, in some of which much confidence may be placed. Dr. Black asserts, that one grain is sufficient for all the necessary experiments for its discovery.

1. Hot and fresh-made lime-water, added to a fluid containing arsenic, will precipitate 1-30th of a grain of the metal, dissolved in 100 grains of water.*

2. Water, saturated with sulphuretted hydrogen gas, formed by the action of diluted muriatic acid on sulphuretted iron, is a delicate test, and produces an orange-yellow precipitate, which is hydrosulphuret of arsenic; it will appear sooner if a few drops of acetic acid be added; this test produces no precipitate with the phosphate of soda. The same effect is occasioned by the addition of sulphuret of ammonia, or hydrosulphuret of

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* See the review of Dr. Jaeger's Thesis in the Edin. Medical and Physical Journal, vol. vii.

potash; but as the hydrosulphurets produce a precipitate from solutions of tartarized antimony, similar to those of arsenic, they must be considered only as collateral tests.*

3. Arsenic, thrown on a burning coal, gives white fumes, and a smell of sulphur followed by that of garlic; but if thrown on hot iron, without being mixed with some combustible substance to reduce it to the metallic state, *it will not* give out this odour. This test is not to be depended upon, as phosphorus and zinc emit the same smell.†

4. Arsenic, mixed with half its weight of powdered charcoal, moistened with oil, placed between two polished copper plates, bound together with wire, and submitted to a red heat, leaves a white silvery stain on the copper, which will not be removed by rubbing; but this test sometimes fails; and mercury leaves a similar stain, though *not indelible.*

5. Boil a small portion of suspected pow-

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* Dr. Bostock, in Edinburgh Med. and Surg. Journal, vol. v. p. 166.

† Dr. Jaeger's Thesis.

der with a dilute solution of potash, in a few ounces of distilled water, in a clean Florence flask, and filter the solution; to which add a few drops of the solution of sulphate of copper: if arsenic is present, it will be strongly manifested by a yellowish green precipitate, which is the pigment called Sheele's green.

In making this experiment, the colour varies according to the proportions of the ingredients: those which Dr. Bostock has found to answer best, are one part of arsenic, three of potash, and five of sulphate of copper. In employing this test, the fluid should be viewed by reflected, and not transmitted light; and the experiment must be made by day-light. The validity of this test, however, has been shaken by some experiments, detailed at the trial of Mr. Donnall, at Launceston, in 1817, when it was stated, that if to a solution of sulphate of copper, in a decoction of onions, a small quantity of a solution of potash be added, a precipitate is formed, resembling in colour Sheele's green. This experiment I have frequently repeated, and find the similarity of colour to be very striking; but the supernatant fluid retains, on standing, a bluish green colour, whilst, where arsenic is present, it becomes clear and colourless.

6. To a grain of the suspected powder, add the same quantity of charcoal, and two drops of oil, and add two grains of dry carbonate of potash, and one of charcoal; put them into a glass tube, hermetically sealed at one end, which must be coated with pipe clay and sand; in that end place the mixture, and close the other loosely with paper; place the coated end in the fire, or in a chafing-dish of burning charcoal, taking care not to breathe the fumes: if arsenic be present, it will rise, and line the inner surface of the tube with a brilliant coating; break the tube, and lay a little of the reduced metal on hot charcoal, and the smell of garlic will be perceived; or place it between plates of copper, and a white stain will be produced, as in the above-mentioned experiments. The garlic odour will also be evident if the glass be cautiously applied to the nose whilst cooling: this is justly deemed the *experimentum crucis*; it is the most decisive, though not a very minute test.

7. Another test, lately discovered, and extremely delicate, is applied, by adding to the

suspected powder a few ounces of distilled water, and boiling it in a flask with a few grains of subcarbonate of potash or soda, agitating it with a glass rod. When cold, touch the surface of this fluid with a stick of dry nitrate of silver or lunar caustic: if arsenic be present, a beautiful yellow precipitate will instantly appear at the point of contact, and sink to the bottom.*

This must now be considered only as a corroborative test, it having recently been ascertained, that when the nitrate of silver is added to a solution containing an alkaline phosphate, or phosphoric acid, a yellow precipitate is thrown down, exactly resembling in colour and appearance the arseniate of silver: in judicial cases, therefore, it is best to mix the supposed arseniate of silver with a little potash and charcoal powder, and expose it to heat in a glass tube; a pellicle of metallic arsenic will be found in the tube, as described in test No. 6, unless the quantity of arsenic be very small indeed; but the phosphate of silver neither yields a white smoke nor a crystalline sublimate by the same treatment.*

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* For excellent observations on this subject, see a paper in the Edinburgh Medical and Surgical Journal, by Dr. Bostock; vol. ii. of Dr. Henry's Elements of Chemistry; vol. xxxiii. of Philosophical Magazine, by Mr. Hume; vol. ii. of Med. Chirurg. Transactions, by Dr. Roget.

Dr. Paris, in a paper read before the Geological Society of Cornwall, states, that the results of this experiment will be more unequivocal, if conducted in the following manner: "Drop the suspected liquor upon writing paper, making a broad line with it; along this line draw slowly a stick of lunar caustic, which will produce a streak resembling the colour of what is known by the name of *Indian yellow*, which colour is alike produced by arsenic and phosphoric salts; but that from arsenic is rough and curdy, as if effected by a crayon; the other quite smooth and even in its appearance, such as would be produced by a water colour. In less than two minutes the phosphoric yellow fades into a *sad green*, becoming gradually darker until it becomes black: the arsenical yellow, on the other hand, remains permanent for some time, when it becomes brown. In performing these experiments the sun-shine should be avoided, or the transition of the colour is too rapid.

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* Dr. Marcet, in the Medico-chirurgical Transactions, vol. vi. p. 663.

Phosphoric acid is contained in large quantity in the bones and in the urine of animals, but it is very improbable that it should ever be found in the fluids generated in the stomach in such a state and quantity as to yield a precipitate with the nitrate of silver.

8. The ammoniaco-nitrate of silver, however unlike the simple nitrate, is not liable to this objection, not forming any combination with phosphoric salts; if, therefore, instead of potash or soda, a few drops of a solution of *pure ammonia* be added, and the surface be touched with a stick of nitrate of silver, a yellow precipitate is formed, but does not sink so rapidly as when the experiment is made with the other salts. This experiment is more decisive, as no precipitate is formed, although the phosphate of soda be present.

Arsenic, dissolved in milk, is difficult to detect, but, by evaporating it to dryness, and re-dissolving it in distilled water, its presence may be indicated by the above-mentioned tests.

In all experiments of this kind, distilled water should be employed; and in making trials on suspected substances, it would be advisable to make corresponding trials with arsenic itself, that the comparison may be accurate. It should be remembered, that the intensity of colour in the precipitate thrown down in these experiments, will vary according to the quantity of materials employed; and the experimenter should not be surprised at finding a shade of difference in the colour, on repeating his experiments on the same substance, or in corresponding trials on solutions of real arsenic.

The conversion of syrup of violets to a beautiful green colour, on the addition of a solution of arsenic, has been adduced as a test,* but it is very difficult to procure syrup of violets pure and free from a tint of green; moreover, solutions of potash, soda, subcarbonate of ammonia and lime, produce the same effect. Orfila denies that arsenious acid has any effect on syrup of violets. When the quantity of arsenic is too small to be reproduced in the metallic form, by test No. 6, it is advisable that not one only, but all the other tests should be tried, which, if uniform in their results, will, at least, furnish *very strong presumptive evidence* of its presence; in truth, I conceive that the testimony may be considered decisive, and that if we are to withhold our assent from this position, all deductions obtained by chemical experiment must be considered as nugatory.

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* See the evidence of Dr. Adington, on the trial of Mary Blandy, for the murder of her father.—Hargrave's Trials.

Arsenic does not (as has been recently asserted) blacken a knife, by which it is cut; nor does it, when mixed with dough, prevent its rising.* The colour of bile is not changed by admixture with arsenic in solution.

MERCURY.

Most of the preparations of mercury are active medicines, and several of them violent poisons, as the *nitrous oxide of mercury*, or red precipitate (Hydrarg. nitrico-oxydum), the *red*

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* See the extraordinary evidence in the trial of Eliza Fenning.

oxide of mercury (Hydrarg. oxydirubrum), and the *oxymuriate of mercury*, or *corrosive sublimate* (Hydrarg. oxymurias), the last of which is one of the most violent poisons with which we are acquainted. It requires about twenty times its weight of water for solution, but very readily dissolves in alcohol. This substance, taken internally, even in very small quantity, produces sickness, severe griping, pain in the stomach and bowels, excessive vomiting and purging of frothy mucus, sometimes of blood, distention of the belly, suppression of urine, coppery taste and heat in the mouth and throat, great thirst, cold sweats, anxiety, universal pains, convulsions, and death. This preparation of mercury acts instantaneously, corroding and destroying the parts to which it is applied:* when patients survive the immediate agency of this poison, they are affected with sloughing of the mouth and gums, fœtid breath, salivation and extreme debility. Mercury acts very differently in different constitutions, and in some a single grain of corrosive sublimate (particularly in debilitated frames) will cause ptyalism. It is poisonous to all animals, but does not act on all with equal violence; from some experiments made by the

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* Monsieur Pouqueville, physician to the French army in Egypt, who was a prisoner at Constantinople in the year 1798, speaks of a man, who had, from habit, enabled his stomach to bear large doses of corrosive sublimate. "This man," says he, "was well known all over Constantinople in the year 1800, by the name of *Suleyman Yeyen*, or *Suley-*

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man the taker of corrosive sublimate. At the epoch when I was there, he was supposed to be nearly a hundred years old, having lived under the Sultans Achmet III. Abdul Hamet, and Selim III.: he had early in life habituated himself to taking opium; but, notwithstanding that he constantly increased the dose, he ceased to feel from it the desired effect, and then tried sublimate, the effects of which he had heard highly spoken of: for thirty years this old man never ceased to take it daily; and the quantity he could now bear, exceeded a drachm. It is said, at this epoch he came into the shop of a Jewish apothecary, and asked for a drachm of sublimate, which he swallowed immediately, having first mixed it in a glass of water. The apothecary, terrified, and fearing that he should be accused of poisoning a Turk, immediately shut up his shop, reproaching himself bitterly with what he had done; but his surprise was very great, when, the next day, the Turk came again, and asked for a like dose of sublimate." See M. Pouqueville's Travels, p. 299. See also Mr. Thornton's Travels; and Notes to Lord Byron's Childe Harold's Pilgrimage.

late Dr. Reeve, of Norwich, it appears that a horse recovered, after having taken an ounce of it, and was not very violently affected, even by that quantity. It has produced bad effects when applied externally, in form of lotion or plaster; but in the experiments made by Mr. Brodie on animals, he did not find it poisonous when so applied.

The red precipitate, and red oxide of mercury, produce violent purging and vomiting, pains in the stomach and bowels, and other distressing effects.

It is well known that lead, in its various preparations, may be taken internally for a considerable time, and produce its deadly effects slowly, and without exciting suspicion of the cause, and it is probable that the accumulated power of arsenic and corrosive sublimate might act on the constitution as a slow poison. It has been asserted that the latter may be taken for a long time together, in such small quantities, as to occasion hectic fever and a slow lingering death, without producing salivation, or any other sensible operation; the Countess of Soissons, mother of the celebrated Prince Eugene, was accused, at the latter end of the seventeenth century, of having destroyed her husband by these means.

It has been doubted whether salivation will return, after having entirely subsided, without a fresh exhibition of mercury; but there are recorded many instances of it, and the knowledge of this fact may be essentially serviceable in legal investigations.* Two cases are mentioned by Dr. Mead of the return of salivation, after an interval of some months, when not a particle of mercury had been given during that time.†

After the long continued and improper use of mercury, it has been discovered in different parts of the body, and even in the brain, in form of globules.

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* See evidence of Mr. Bromfield and others, on the interesting trial of Miss Jane Butterfield, at Croydon, in 1775, for the murder of William Scawen, Esq.

In March 1815, I gave a small quantity of triturated mercury to a respectable woman in this town, who had been long ill: she became suddenly and unexpectedly salivated. She soon recovered, and enjoyed better health than she had done for a considerable time. In October, without (as she informed me) having taken any medicine whatever, the salivation returned with extreme violence, her mouth became sloughed and mortified, and in a few weeks she died.

† Mead on Poisons, 4th edition, page 196.

Remedies.

The antidotes to corrosive sublimate, or either of the other mercurial salts, have usually been considered the same as those mentioned as remedies for the poison of arsenic; but, from the experiments of M. Orfila, albumen, or the white of eggs, is the only counter-poison to corrosive sublimate: intimately mixed with it, it decomposes it, forming a triple compound, consisting of albumen, muriatic acid, and calomel, which may be taken in considerable doses with impunity.* *Large quantities*, therefore, of whites of eggs, well mixed with water or milk, should be immediately administered in all cases of poison by this salt. Whether or not, on repeated trials, albumen shall be found to be really an *antidote* to corrosive sublimate, its use will always be proper: in general, more reliance is to be placed on plentiful dilution, by mild and mucilaginous fluids, and the evacuation of the poison by vomiting, than on chemical remedies. Butter and oily substances are useless, and powdered charcoal, recommended by M. Bertrand, is at least a doubtful remedy. Blisters should be applied to the region of the stomach, and blood taken from the arm, if not contra-indicated by the state of the circulation. The pulse, however, though small, will become fuller and stronger after the abstraction of blood. As acrid and corrosive poisons occasion inflammation in the stomach and bowels, it is reasonable that the secondary treatment should be similar to that usually prescribed for those complaints.

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* In the trials which I have made on dogs with corrosive sublimate, I have found, that even a few grains, well rubbed down with albumen, cause violent sickness, and exert considerable activity. I have not tied the œsophagus to prevent the animal from vomiting, as I confess I have no taste for such cruel experiments.

Dissection.

The œsophagus, particularly the lower part, is generally inflamed; the stomach is sometimes eroded, and its villous coat covered with dark-coloured spots, indicating inflammation, which extends to the intestines: it generally contains a small quantity of mucous fluid mixed with blood. The liver is often found inflamed, and in females the uterus is frequently similarly affected.

Tests.

The matter vomited, and the contents of the stomach, should be collected and examined, as is directed for the discovery of arsenic. Corrosive sublimate is white, and may be known by its metallic and peculiarly styptic disagreeable taste; it is soluble in about twenty times its weight of water.

1. Expose a small quantity of it, without any admixture, in a coated glass tube (as directed for the treatment of arsenic), to a strong heat; the sublimate will rise to the top of the tube, lining its surface in the form of a shining white coat: if it is in a dissolved state, the solution may be evaporated, and the residuum treated in the same way.

2. To a solution in distilled water, add a small quantity of a dilute solution of subcarbonate of potash, and a copious precipitate of a red orange colour will be formed. The carbonate of soda produces similar effects.

3. *Sulphuretted water throws down a dark-coloured sediment, which, when dried and strongly heated, is wholly volatilized, without any odour of garlic.

4. A piece of copper, exposed to the fumes of corrosive sublimate, becomes whitened; and if rubbed with the hand, acquires a silvery hue.

5. †Nitrate of tin is a very delicate test: one drop only, produces an immediate and copious dark-brown precipitation.

6. If to a very dilute solution of carbonate of ammonia, a few drops of solution of corrosive sublimate in water be added, the whole acquires a milky colour, and a white substance is precipitated, which in a few hours acquires a slate colour.

7. If to a very dilute solution of pure ammonia a few drops of watery solution of corrosive sublimate be added, an instant and copious precipitation takes place, of a white

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* Henry's Elements of Experimental Chemistry.

† This test, Dr. Bostock says, is capable of detecting the three millionth part of a grain in solution. See Edin. Journal, fifth vol.

flocculent matter resembling curds, which falls to the bottom.

8. When corrosive sublimate is in very small quantity, it may be detected by placing in the solution a piece of gold clasped with zinc wire, and submitting it to the action of galvanism; when, after some time, the gold will be whitened by the precipitation of the mercury upon it.*

9. Lime-water causes a precipitate of an orange-yellow colour.

10. A solution of corrosive sublimate, even though very weak, instantly tarnishes polished silver immersed in it, and gives it a dull pewter colour, not easily removed.

11. Human bile, added to a solution of this salt, is said to precipitate it of a reddish yellow colour;† but this is very uncertain, as it frequently affords no precipitate or change of colour, which probably depends on the quality of the bile, which, at different times, and in different individuals greatly varies. Ox bile

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* See Dr. Bostock's paper in the fifth vol. of the Edin. Med. and Phys. Journal.

† Orfila, Traité des Poisons, tom. i. p. 54.

gives the solution a dark green colour, and pig's a dirty red.

12. Albumen, or the white of eggs, well mixed with water, is a delicate test. A small quantity added to a solution of this salt causes an immediate milky turbidness; and a copious white flocculent precipitate gradually falls to the bottom, which by chemical analysis is found to consist of submuriate of mercury and animal matter. The experiment should be made with *cold water*, as albumen is coagulated by heat.

The nitrous oxide of mercury, or red precipitate, and the red oxide, are not very soluble in water, and may be known by their bright shining red colour.

ANTIMONY.

Most of the preparations of antimony act very powerfully on the human body, and, when given in large doses, produce violent vomiting and purging.

The *muriate*, commonly called *butter of antimony*, is a strong escharotic.

Tartarised antimony, taken in large doses, sometimes occasions death, and appears to act as a direct sedative.

I was sometime since called to a child who had taken a large dose of it, in whom no vomiting had taken place: he lay in a state of insensibility, the extremities were cold, and the pulse languid and almost imperceptible; but by taking some strong brandy and water, these effects were removed, violent vomiting succeeded, and the child recovered. Tartar emetic inserted into a wound produces the same effects as arsenic.*

In the only case of poisoning by tartar emetic which I have seen, the person was affected with violent convulsions, which returned at intervals for several weeks after recovery from the immediate effects of the poison.

Remedies.

Decoction of oak-bark, of chinchona, or strong tea, and other astringents, are supposed by M. Orfila to counteract the effects of tartar emetic; but the chief dependence is to be placed on mucilaginous and diluent drinks, and speedily removing the poison from the stomach; when that is done, opium and blisters might be serviceable.

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* See Mr. Brodie's Experiments.

Tests.

The tincture of galls is the most delicate test of the presence of tartarised antimony, with which it affords a copious curdy precipitate of a dirty yellow colour.

The *nitrate of silver*, though the strongest caustic we possess, is often used with great advantage as a collyrium, in a largely diluted state, and has been given internally in doses of one quarter of a grain in cases of dropsy, epilepsy, and angina pectoris; if taken in larger quantity it excites vomiting and purging, heat in the mouth, throat, and stomach, which are injured and corroded by it: it speedily decomposes and destroys animal substances, and stains them of an indelible black colour.

I believe there is no case recorded of a person having been killed by it, though solutions of it have been accidentally taken; in which case, *common salt*, dissolved in water, is the best remedy.

Test. The presence of nitrate of silver may be detected by reversing the experiment No. 7, page 80; on the addition of the arseniate of potash a yellow precipitate will be produced; or if a plate of copper be immersed in a fluid containing this salt, the silver will be precipitated on its surface in a brilliant metallic form.

The *carbonate* of barytes is a violent corrosive poison. In Lancashire and Cumberland, where it is found, it is employed to destroy vermin.

The *muriate* of barytes, though frequently used in medicine, is poisonous. If given in large doses, these earths produce symptoms similar to those occasioned by arsenic, but not so violent.

The *remedies* for these poisons are the same as have been recommended for arsenic; but the sulphates of soda and magnesia are considered their chief antidotes.

Tests.

The carbonate of barytes is tasteless, and nearly insoluble in water; it may be discovered by dissolving a portion of it in muriatic acid, and pouring some of the solution into distilled water, to which, on the addition of a few drops of sulphuric acid, a copious *white* precipitate will fall, which is *insoluble.*

The *muriate,* or any other barytic salt, may be discovered by the same test, which will give a similar precipitate.

The *muriate of tin,* taken internally, excites violent vomiting, great depression, and death, without convulsions.

Its antidote is milk, which it speedily coagulates; and by chemical combination with it, the poison is rendered inert.

On *dissection,* the stomach is found to be corrugated and indurated, and has been compared to tanned skin, but its colour is not altered.

There are some other metallic salts, as those of gold, bismuth, &c. which are poisonous; but as it is not probable they will ever be the subject of judicial inquiry, I shall not speak of them here.

Phosphorus dissolved in oil is an active poison; it corrodes the stomach, and causes exquisite torture.

Hair cut very fine, and pounded *glass*, are supposed by the irritation they occasion, to be capable of exciting inflammation in the stomach and bowels; but, from some late experiments on animals, they have not been found to produce this effect; there are, however, a sufficient number of instances on record of dreadful effects resulting from swallowing glass. In such cases, the remedies are, fat, oily, and mucilaginous drinks, &c. and gentle laxatives. If inflammation has taken place, bleeding, blistering, and other remedies adapted to the cure of idiopathic inflammation should be resorted to.

Nitrate of potash, or *saltpetre*, taken in too large a quantity, acts violently on the stomach and bowels, and occasions death. There are several cases recorded of its having been taken by mistake for Glauber's salt. The patients are seized with vomiting and purging of blood, accompanied with violent pain, and subsequent death. A few grains only inserted in a wound occasions fatal gangrene. It is frequently employed as an external remedy, by farriers, with the most pernicious consequences.

MINERAL ACIDS.

The *mineral acids* are much used in medicine, and not unfrequently taken by mistake in an undiluted state, particularly by children.

They are so strong and caustic, that unless forcibly poured down the throat, or swallowed in the rapid manner in which we take a nauseous medicine, it is not probable that they could be introduced into the stomach in large quantity, except by a person willing to destroy himself. When mineral acids are taken in large doses, they occasion instant and most violent pains in the mouth, throat, and stomach, accompanied with great agitation and excessive vomiting of a yellow matter; purging soon follows, attended with painful tenesmus, colic, and strangury; the surface of the body is cold, and covered with moisture; the thirst is urgent, the pulse imperceptible, but the faculties are not impaired.

These symptoms, like those succeeding the exhibition of arsenic, are not uniform; instances being recorded, of persons having died without experiencing any violent pain, whose stomachs after death have been found completely eroded.

Death is often a speedy, but never a sudden consequence of these poisons. If the unfortunate person does not soon fall a sacrifice to their violent action, his future life is generally miserable; frequent vomiting, emaciation, excessive costiveness, fetid salivation, exfoliation of the membrane lining the mouth, œsophagus, and stomach, universal pains and premature old age, hurry him to an early grave. These are the effects produced by the nitric acid;* those occasioned by other strong mineral acids are nearly the same. The nitric acid is frequently taken as a poison in France, by those who are driven to commit suicide.

Remedies.

The bad effects which arise from this class of poisons are to be prevented by neutralizing them, through the agency of chemical substances; weakening them by plentiful dilution, and defending the parts from their action by sheathing and mucilaginous fluids.

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* Vide Traité de l'Empoisonment par l'Acide Nitrique, par A. E. Tartra. Paris.

The first is to be effected by pouring into the stomach as quickly as possible (for, on the early and almost instant administration of antacids, the only probability of recovery depends), large quantities of dissolved soap, magnesia, or chalk, mixed with water, and diluted alkalis.*

The patient should be made to drink plentifully of diluent and demulcent liquids, as linseed-tea, gruel, and particularly *milk*. Injections of the same kind should be frequently administered, and all irritating and stimulating circumstances carefully avoided.

When *vitriolic acid* has been taken, water *alone* should not be used as a diluent, as intense heat is generated by the mixture: it should be employed only as a vehicle for alkalis and antacids;† nor should *pure* magnesia be given, as when suddenly added to concentrated sulphuric acid, prodigious heat and vapour are excited, frequently accompanied with an extrication of light.* Carbonate of magnesia has not this effect, and is a proper remedy.

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* Vide M. Fourcroy, Système, vol. i.

† Four parts of concentrated sulphuric acid, and one of water, mixed at the temperature of 50° of Fahrenheit, have their temperature raised to 300°.

When the acid is neutralized or discharged, a blister on the stomach would probably be productive of benefit.

Dissection.

When a person dies from the effects of mineral acids, a short time after having taken them, the external parts of the body are, on examination, found in a natural state; but, if any has fallen on the skin, the epidermis will be destroyed, the membrane lining the mouth and œsophagus is burnt, and hangs loose, and the parts beneath inflamed and blood-shot. The teeth are loose, the stomach is generally swelled and eroded, and its texture so much destroyed, that the finger may be easily pushed through it. It contains a bloody fluid, mixed with froth, and a great deal of air. The sides of the stomach are covered with gangrenous spots, and the pylorus is much contracted. The larger intestines exhibit nearly the same appearances. The viscera are inflamed and sometimes burnt by the acid, which often escapes through the stomach. The bladder is found empty. When the nitric acid has been taken, the skin, and every part that it has touched, is stained of a yellow colour. The teeth are loose and yellow on their crowns; and the air found in the stomach has a smell resembling that of bitter almonds.*

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* Henry's Chemistry, vol. i. p. 382.

Tests.

The matter vomited should be collected, filtered, and examined; and if any of the poisonous fluid is left in the phial or vessel from which it has been taken, that should also be subjected to analysis.

Sulphuric acid. If there is reason to suppose that this acid has been taken, filter a portion of the vomited matter, and add to it a few drops of a solution of barytes; if the smallest portion of the acid be present, a precipitate will fall, which is not soluble in muriatic acid: potash, or chalk added to it, will cause a considerable effervescence.

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* Tartra.

The *muriatic acid* may be detected by adding a small quantity of nitrate of silver, or lunar caustic, when a white flaky precipitate falls, which, on exposure for some time to the light, becomes bluish, and afterwards black.* The nitrate of mercury is also a very delicate test of this acid; and if the smallest quantity be present, a dark-coloured precipitate is deposited.

The *nitric acid* stains all animal substances of a yellow colour; its presence may be ascertained by warming a portion of the suspected fluid, and adding to it some sulphuric acid; if a glass stopper, moistened with a solution of pure ammonia, be held over the vessel, white clouds will appear rising from the stopper.

The *oxalic acid*, vulgarly called acid of sugar, which has lately been much employed for removing stains from linen, and other domestic purposes, is a violent and quick poison. It has a strong resemblance to sulphate of magnesia, or Epsom salts, and several instances have occurred where it has been taken by mistake for that useful medicine. It causes death in a few hours, but sometimes without vomiting or much pain; its action much resembles that of arsenic.

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* Dr. Henry's Elements of Chemistry.

The remedy is plentiful dilution with milk, gruel, or water, in which magnesia, the alkalis, but particularly chalk, or slacked lime are dissolved or suspended.

Dissection. The texture of the cuticular coat of the œsophagus has been found destroyed, and the stomach eroded and perforated, its substance being converted into a pultaceous mass, so tender as to be torn by the slightest force;* in other cases no erosion has been observed, but an universal and very remarkable degree of inflammation of the œsophagus and stomach, not extending to the bowels.

Test. The test of oxalic acid is lime-water, which throws down a milky precipitate.

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* London Medical Repository, vol. iii. p. 380; and vol. vi. p. 474.

AERIAL POISONS.

DEATH occasioned by *carbonic acid gas*, is generally accidental, though a child or drunken person might be wilfully exposed to its action; it is destructive to all animals, though vegetables thrive in it: it is generated largely by burning charcoal and fermenting liquors, and is often produced by nature, and exists in wells, pits, and caves; being heavier than atmospherical air, it is found near the bottom of these places.* Persons sleeping in a room where charcoal is burning, or leaning over vats in which the fermentative process is going on, frequently fall victims to its pernicious effects.

Those who are employed to superintend the burning of lime, often sleep by the side of the kiln; and if the wind happens to change, the carbonic acid gas, (which is largely generated by exposing lime to heat,) is blown upon, and sometimes destroys them.

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* The famous Grotto del Cane, near Naples, is celebrated for the noxious effect which the air lying at its bottom, has upon dogs and other animals, too low to raise their heads above it.

This gas produces death, according to Morgagni, Hales, Hoffman, and others, by suffocation; occasioning chilliness, head-ache, sleepiness, giddiness, retching, sickness, insensibility, and complete asphyxia. The eyes are often open and staring, the tongue protruded, and the jaws frequently locked upon it; the fists are clenched, and the body convulsed, and apparently in a state of apoplexy. At other times it acts immediately on the nerves and brain, and in a moment arrests the vital functions. Those exposed to the vapours of the fermenting grape, are as instantaneously destroyed as by the electric shock.*

If, during the burning of charcoal, moisture be present, *hydrocarbonous gas* is evolved, which is so peculiarly fatal to life, that Sir Humphry Davy was nearly killed by taking three inspirations of it.

Remedies.

The means of obviating the bad effects of this gas, are, to remove the body into the open air, dash cold water upon it, and pour, through a funnel, or flexible catheter, vinegar and water into the stomach.* Air should be blown into the lungs, and the action of breathing imitated: stimulating clysters should be administered, a *small quantity* of blood taken from the arm, and pungent salts applied to the nostrils. Friction with the hand, or warm flannels, is of great service; if these fail, the hot bath should be tried, oxygen gas blown into the lungs, and electric or galvanic shocks passed through the chest. Tobacco, either in form of smoke or infusion, ought on no account to be used. The body should never be left while there is any hope, and hope should not be speedily abandoned. I have seen persons recover after lying in an insensible state several days. During the progress of recovery, the mental powers are greatly impaired, and the body is sometimes slightly paralysed. We are informed by Dr. Guthrie, that in Russia, and other cold climates, where these accidents are common, the body is carried into the open air, and rubbed with snow with the best effects. Fever is apt to supervene on recovery. Pits, wells, deep vaults, &c. should not be entered immediately they are opened; it is a good precaution first to let down a lighted torch or candle; for, where these will not burn, animal life cannot be long sustained.

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* Dr. Percival on the Poison of Lead.

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* Dr. Percival on the Poison of Lead.

The nitrous and sulphurous acid gasses are destructive to animal life, and instances have been recorded of fatal effects produced by them; a remarkable instance of death occasioned by inspiring nitrous gas, has been detailed by Dr. Degranges, of Lyons,* in which the bad effects were not experienced till the expiration of several hours after exposure to its baneful influence.

The carburetted hydrogen gas, or fire-damp, which is formed, in large quantity, at the bottom of coal-pits, though not properly called a poison, is frequently the cause of the death of many of the miners, by unexpected explosion. An apparatus has lately been contrived, by Sir Humphry Davy and by Dr.

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* Dictionnaire des Sciences Medicales, tom. ii. p. 388.

Murray, for preventing these dreadful effects, by gradually consuming the gas.*

Dissection.

The body is sometimes much swelled, and has the appearance of having been strangled:† it is supposed to retain its heat longer than when life has been destroyed by any other means. The ventricles of the brain have in some cases been found to contain a serous fluid, tinged with blood; the lungs collapsed, stuffed with frothy blood, and the abdominal viscera dark-coloured and turgid.

The fumes arising from many of the metals in a state of fusion, or aërial solution, are extremely pernicious; those from lead occasion asthma, pains in the chest and body, paralysis, &c.

The fumes of arsenic cause dryness of the tongue, a sense of suffocation, head-ache, vomiting; and, by long exposure, pulmonary consumption is a frequent consequence. Arsenic, dissolved in hydrogen gas, called arseniated hydrogen gas, is highly dangerous. The death of M. Gehlen, the celebrated German chemist, was lately occasioned by respiring this air, which he was preparing for an experiment: he was seized with uninterrupted vomiting, rigors, and excessive prostration of strength; these symptoms continued for nine days, when he died; although every effort was made for his relief.

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* See Philosophical Magazine, for December, 1815.

† Prestwick on Poisons.

The fumes arising from mercury are very deleterious; they occasion salivation, tremor, paralysis, and extreme weakness. Quicksilver being much used in the arts of gilding metals, silvering mirrors, &c. workmen often suffer severely from its pernicious effects, of which frequent instances occur in Birmingham; these effects are probably occasioned by the metal in the state of vapour, and not of oxydation; as by an apparatus, affixed to the chimney of the workshop, a considerable portion may be caught in its metallic state, which, as a system of economy, is often practised.

Remedies.

The best means of cure are the frequent repetition of active doses of castor-oil, the use of the warm bath, pure air, and a course of medicines containing sulphur, as the hydrosulphuret of potash or ammonia.

Those who wish for farther information on this subject, I refer to a Philosophical History of Mineral Poisons, by Dr. John Johnstone; and the *Traité des Poisons*, &c. par M. P. Orfila.

WOUNDS AND CONTUSIONS.

Surgeons are frequently required to pronounce whether certain wounds are or are not mortal: and, if a wounded person dies, whether his death has been the consequence of those wounds.

Wounds may be properly divided into four classes: first, mortal; secondly, dangerous; thirdly, accidentally mortal; fourthly, certainly not mortal.

The consequences of wounds depend much

on the constitution, age, existing diseases, and habits of life of those on whom they are inflicted; for, a wound which would be fatal to one person, may not be even dangerous to another: they are also more dangerous in some parts of the body than in others. A wound may prove fatal from bad treatment, which might otherwise have been healed, unattended with danger.

It is in some cases difficult to say to what class a wound belongs; for some, which we should suppose to be mortal, often prove otherwise. There have been instances of persons whose brain has been wounded to a considerable depth, who have recovered: others, shot through the head, have survived. A pauper in Paris, some years ago, used to receive charity in a piece of his skull. Recovery from dangerous wounds in the lungs, liver, stomach, intestines, and bladder, have been noticed in works on Military Surgery:* the remarkable cases of a bayonet wound in the heart,* and a ball lodged in that viscus without causing immediate death, are well attested;† and the singular circumstance of the shaft of a gig passing through the thorax, without destroying life, has been recorded by Mr. Maiden. On the other hand, wounds, which at first sight appear trifling, are occasionally the cause of death. A slight blow may rupture an artery diseased by aneurism, or burst a vomica in the lungs; or a wound in the hand or foot, occasion locked jaw.

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* Dr. Thompson's Observations made in the British Hospitals in Belgium, after the battle of Waterloo.

I shall not specify the wounds that may or may not be deemed mortal; for, as our laws look to the intention with which they are inflicted, rather than their effects, a minute classification of them is not of so much consequence as formerly, when if the wounded person lived a year and a day, it was not deemed murder; but by the act of the legislature, called the Ellenborough Act, wounding, with an intent to kill, is deemed equally criminal, whether death be the result or not. Nor shall I say any thing on the treatment of

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[*] Medico-chirurgical Transactions, vol. ii.

[†] Edin. Med. and Surg. Journal, vol. xii. and xiv.

wounds, for that is the province of surgery; but a barrister should endeavour to discover, whether a wound has been properly treated or not; for, if the patient has died from bad surgery, or want of medical care, a prisoner should be acquitted of the charge of murder. We should examine wounds carefully, and, if possible, ascertain whether they have been inflicted during life, and been the cause of death; or given afterwards, to conceal the manner in which the deceased has been destroyed. In the reign of Charles II. Sir Edmonsbury Godfrey, who was hanged or strangled, was discovered in a ditch, with his own sword run through his body; but as no blood issued from the wound, which was evidently given after death, an inquiry was instituted, and the means by which he was killed ascertained; though it is probable that those who suffered for the crime were innocent of it. A wound received during life, will exhibit appearances of inflammation, and cause greater hemorrhage than one received after death.

A blow, in itself not very violent, may cause death, by its impression on very sensible organs, or, by forcing a person down, cause concussion of the brain. Fractures of the skull are sometimes to be found at a distance from the place where the blow has been received. Mr. C. Bell has remarked, that the skull being constructed on the principles of an arch, accounts for the fact, that a man falling on his head, or struck on the vertex, does not suffer on the part struck, but has a fissure at the temporal angle of the parietal bone. The same author has published an extraordinary case of sudden death occurring in consequence of fracture in the base of the skull some weeks after the accident happened, and when the patient had apparently recovered from its effects. On dissection, it was discovered, that the roughened edge of the foramen magnum had, by a sudden turn of the head, lacerated the spinal marrow.* Blows on the head may lay the foundation of future evils of the most serious nature. This method of punishing children, sometimes practised at schools, cannot be too much reprehended. A blow on the region of the stomach sometimes occasions instant death, probably by its impulse on the nerves paralysing the heart, as that organ and the stomach are supplied with branches of the same nerves, viz. the eighth pair and great sympathetics. Pressure on the phrenic nerve, causing paralysis of the diaphragm, may also probably tend to produce the same effect. In these cases the heart is found devoid of blood, and the stomach sometimes appears red and inflamed; but this appearance, I conceive, is not to be attributed to inflammation (which cannot be supposed to take place after death) but to the settling or stagnation of blood in the extreme branches of the arteries, in consequence of the sudden cessation of the action of the heart, and of the circulation. Death may be occasioned by a blow on the stomach, even although it is full and distended with food, without occasioning vomiting. A blow on the liver may rupture it, and I have known an instance of this viscus being ruptured by the sudden action of the abdominal muscles upon it, in endeavouring to avoid a fall from a horse. A violent blow or concussion on the abdomen, sometimes occasions rupture of the intestines and death, without inflicting any apparent external injury. We should be cautious how we conclude, from the appearance of bruises or ecchymosis, that a person has died by the hands of another; they may have been produced by the fall of one who has died of apoplexy, or been struck by lightning; and in some constitutions will be very extensive from a slight cause.

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* *Vide* Surgical Observations, vol. i. p. 482.

It is necessary to discover by what weapon or instrument a wound has been inflicted; and if the person is dead or senseless, whether it has been given by himself or by another: if any weapon is found near the deceased, we should ascertain if that could possibly have been the cause of the injury, or whether it has been placed there afterwards. A man was found shot, and his own pistol discovered lying near him, from which circumstance (and no person having been seen to enter or leave the house of the deceased) it was concluded he had destroyed himself; but, on examining the ball by which he had been killed, it was found to be too large ever to have entered that pistol; in consequence of which discovery, suspicion fell upon the real murderers.

LIGHTNING.

When a person is destroyed by lightning the body is generally much scorched, but sudden death sometimes occurs, which can be attributed to no other cause, although the cloaths and body are uninjured, and the tempest appeared to be at a distance.* This can only be accounted for by supposing it to be the result of a discharge of the electric fluid from the earth,† or what Lord Stanhope calls the *returning stroke,*‡ which has long since been described by Signior Beccaria, to consist of the attraction of electric fluid from the earth by a negative cloud after a discharge from a positive one, in order to restore the equilibrium; which return may take place at a considerable distance from the positive cloud whence the lightning proceeded.

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* See Memoirs of the Literary and Philosophical Society of Manchester, vol. ii. series ii. p. 264.

† Priestley's Hist. of Electricity, vol. i. p. 394.

‡ Philosophical Transactions, vol. lxxvii.; and Principles of Electricity, by Charles Viscount Mahon, 1779.

It is supposed by Beccaria and others, that persons are sometimes killed by lightning without being really touched by it, a vacuum of air only being made near them, and the air rushing out of their lungs to supply it, with so much violence, that they cannot recover their breath. As a proof of this, he says, that the lungs of such persons are found flaccid, whereas when they are properly killed by the electric shock, the lungs are inflated. The existence of this vacuum Dr. Priestley admits, but that it is so considerable as to occasion suffocation and death, he thinks improbable.[*] He instituted a set of experiments to prove, that birds, and other small animals, placed near the explosion of an electrifying machine, were not affected by it; but this surely cannot be properly compared to the prodigious and inimitable force of natural lightning. It is, however, certain, that life may be destroyed by the electric fluid without the cloaths or external parts of the body being injured. Beccaria[†] thinks, that a stream of the electric fire may kill merely by causing "a damage to the body of the same kind as might arise from a prodigious and sudden weariness:"* "it seems," he says, "that a certain degree of that sort of injury which I express by the word weariness, is more to be dreaded than any wound, fracture, or burning from lightning."† This appears to be occasioned by the sudden exhaustion of the irritability of the muscular fibre.

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[*] Priestley's History of Electricity, vol. ii. p. 236.

[†] Treatise on Artificial Electricity, p. 272.

Animals killed by lightning soon run into putrefaction; the blood does not coagulate, and the muscles are supposed not to acquire that state of rigidity commonly observed in death; but Beccaria mentions the case of a man rendered exceedingly stiff, presently after being struck dead in a thunder storm.

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* Treatise on Artificial Electricity, p. 272. † Ibid. p. 275.

APPARENT DEATH.

As hysteria, excessive cold, lethargy, catalepsy, trances, and the various causes which produce asphyxia, may destroy all appearance of vitality, without extinguishing animation itself, it behoves those concerned, to take care, that in cases of suspension of the vital functions, and where persons apparently die suddenly, the body be not too early committed to the grave, as there is reason to believe that some have been buried before the extinction of life; and many such cases have been recorded.* A sensible writer, who resided many years at Tripoli, has observed, that in that state, where interment takes place almost immediately life is supposed to be extinct, it is notorious, that many are buried alive.† Various means have been devised of discovering whether or not the vital spark be really extinct, as placing a basin of water on the chest, and observing its motion, holding a mirror before the mouth, &c.;* but the true signs by which death is manifested, have been supposed to be coldness and rigidity of the body, sinking of the eye, dimness and flaccidity of the cornea, lividness of the back, depression and flatness of the loins, the open state of the anus, and the peculiar cadaverous odour;† both Plenck‡ and Haller,‖ however, think that these signs are not infallible, the latter being sometimes perceived in fevers, and the former in apoplectic and drowned persons, who are afterwards restored to life. In cases of death by prussic or zootic acid (which has lately been announced as a new poison, and an instance mentioned by Professor Hufeland, of a thief who destroyed himself with it), the cornea does not collapse, but retains, for a considerable time, its fulness and lustre; and when death is the consequence of exposure to carbonic acid gas, the body retains its heat longer than when it has been occasioned by any other means. In doubtful cases, therefore, the body should not be interred till some degree of putrefaction has commenced.

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* See Diembroeck, lib. ii. Matthæus quæst. med. legal; Hildanus; also Mémoire sur le danger des Inhumations précipitees, par M. Pineau.

† Tully's Narrative, p. 90.

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* See Appendix, note A.

† Blumenbach's Institutes of Physiology.

‡ Elem. Med. et Chirurg. Forensis, p. 167.

‖ Elem. Physiol. vol. viii. part 2. sect. iii.

Where the ordinary and indisputable signs of death do not take place within twenty-four hours after animation has appeared to cease, a medical man should be called to inspect the body. The hearing is supposed to survive the other senses, and to continue when the vital functions are suspended and appear to be annihilated; hence has arisen the custom prevalent among the Romans, and other nations of antiquity of *conclamation*, which consisted in calling the name of the deceased, with a loud voice, for eight days successively, and sprinkling the body with water. On the ninth he was buried; it was then said *conclamatum est*, (he has been called, and is without hope.) This custom is still prevalent in some of the provinces of France.

When persons are recovering from trances, the effects of exhaustion, or long exposure to severe cold, or have been confined in pits, &c.

without food, nutriment of the lightest kind, as water-gruel should be given, and that in small quantity at a time. The external heat should be very gradually augmented, as heat and stimulating food under such circumstances, rapidly exhaust the irritability of the frame. There are many instances of people dying from improper treatment; if they escape sudden death, the fever which usually succeeds to a state of great exhaustion, is increased by it. In the first volume of the Memoirs of the Philosophical Society of Manchester, is related the case of a miner, who was confined eight days in a pit without food. Being at length discovered, he was supplied with a small quantity of water-gruel, which revived him. It was not till the following day that he was got out, when he was put into a warm bed, and fed with chicken broth. Soon afterwards his pulse began to grow quick, and he expired without a struggle.

In this case the external heat probably did the most injury.—In cases of apparent death from falls, drowning, &c. several instances of the benefical, and very remarkable effects of electric shocks passed through the chest, are recorded in the Reports of the Humane Society for 1774, 1787, and following years.—Artificial respiration will also be proper in all cases where the vital functions appear to be suspended.

INFANTICIDE
AND CONCEALED BIRTH.

Nature having implanted in the breast of all animals a strong affection for their offspring, and in both sexes of the human species a sympathetic tenderness towards helpless infants, it seems incredible that the crime of child-murder should ever be committed; nor is it often perpetrated without doing violence to the tenderest propensities of our nature, which are stifled by the strong sense of shame, and dread of infamy, which an unfortunate woman feels, who is on the eve of becoming the mother of an illegitimate child.

It is the opinion of Dr. Hunter that this crime is not committed so often as has been supposed. The laudable wish to preserve her character, frequently induces a woman to conceal her situation, and not being certain how far her pregnancy has advanced, or unacquainted with the symptoms of approaching delivery, she may be seized with pains, which she mistakes for griping in the bowels (which the first pains of labour sometimes greatly resemble), and going to the privy, be there delivered, either of a dead child, or one which, though born alive, may be killed by falling on the ground, or drowned in the profuse discharges of the mother, who, from fear, pain, or insensibility, is unable to assist it. "In such a case," says the humane Dr. Hunter, "is it to be expected, when it would answer no purpose, that a woman should divulge the secret? Will not the best dispositions of mind urge her to preserve her character? She will, therefore, hide every appearance of what has happened as well as she can, though, if the discovery be made, that conduct will be set down as a proof of her guilt."

It is to be feared, that innocent women have sometimes been victims to vague and inconclusive evidence of their guilt, the ignorance of medical witnesses, or the prejudices of a jury. If linen has been prepared for the reception of the expected infant, it is a fair presumption, that the mother did not intend to destroy it, and this circumstance operates strongly in her favour; but, by an act passed in the year 1803 (commonly called the Ellenborough Act), it is ordained, that "women tried for the murder of bastard children, are to be tried by the same rules of evidence and presumption, as by law are allowed to take place in other trials for murder: if *acquitted*, and it shall appear on evidence that the prisoner was delivered of a child, which by law would, if born alive, be *bastard*, and that she did, by secret burying, or otherwise, endeavour to conceal the birth thereof, thereupon it shall be lawful for such court, before which such prisoner shall have been tried, to adjudge that such person shall be committed to the common gaol, or house of correction, for any time not exceeding two years."*

This, then, is the punishment for *concealing the birth* of a bastard child, and is the only punishment that ought ever to be inflicted, unless there is certain and incontrovertible evidence of murder having been committed; but medical evidence alone, unsupported by circumstances, can seldom be considered to be of this decisive character.

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* See Appendix, note B.

The above-mentioned act relates only to bastard children; and a woman who conceals the birth, or privately buries a legitimate child, is not liable to the punishment prescribed by that act. Formerly, if a woman endeavoured to conceal the birth of a bastard child, there was no need to prove that it was born alive, or that there was any sign of hurt upon the body; but it was undeniably taken that the child was born alive, and murdered by the mother; but it has of late years been usual to require some sort of presumptive evidence that the child was born alive, before the other constrained presumption is admitted.*

A medical man should be careful to divest his mind of all prejudice, and not be led to suppose, that because a child is found dead, and the bystanders cry out against the mother, it must necessarily have been murdered. The *canaille* delight in the horrible; and, among the vulgar, every calumny, however ill supported, finds a ready admittance. When called upon in a case of this kind, he should make the following inquiries:—

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* Blackstone's Commentaries.

1st. When, where, and by what means has the child been brought forth? Was the mother standing or reclining?

What persons were present, and what are their characters, and interests, relative to the suspected person?

Was the child abandoned to the cold, famished, or suffocated? Was linen prepared for its reception? Was the labour difficult? Did the fœtus reach its full time? Is it perfect? Are there any bruises, punctures, or marks of violence visible on the body of the child? Was there any unusual flooding? In what state is the mother? Was the cord tied on the part of the child? Was the ligature made before or after its death? Does the blood discovered come from the mother, or the child? Are there any swellings or stoppages in the throat or trachea? Has the child died of convulsions, or any other disease? Was the child born alive?

Did it ever breathe? Was it capable of living when born? How long did it live after birth? What were the causes of its death? Did they occur before or after birth, or during delivery? Was the placenta healthy?

Observations on the above Questions.

It is possible a woman may bring forth her child in a standing position, and, no person being present, it may fall on the ground and be killed, which will account for any bruises which are discovered. A violent contraction of the uterus may have expelled the child whilst the mother was abroad and remote from assistance. Women have brought forth on the night-chair, not aware of their situation. These instances, however, are rare in first pregnancies.

It is necessary to inquire the characters of those present, as it is possible that the child may have been strangled, or otherwise destroyed, by a person interested in its death; or marks of violence may have been imprinted on the body after its natural death by an enemy of its mother.

Though infants may be destroyed by exposure to severe cold, it is probable that this does not happen often, and when it does, the case will scarcely be dubious; nor are they so tender as has been commonly supposed. They are seldom, if ever, famished to death within a few days of their birth, for new-born children require very little nourishment, and it was formerly the custom to keep them some days from the breast; this, however, if suspected, may be ascertained by examining the stomach.

A child may have been drowned in the water or in the discharges of the mother (innocent of its death), or suffocated by thrusting rags or other extraneous substances down its throat. In the first case, the symptoms will be nearly the same as in other cases of drowning,* and will be spoken of in another place;

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* It is the opinion of the celebrated natural historian Buffon, that it is probable a new-born child might sustain a privation of air, for a considerable time, without losing its existence. "At least, the possibility of this I once seemingly confirmed by an experiment upon some young dogs. I put a pregnant bitch, just as she was about to litter, into a tub filled with warm water, where, after fastening her in such a manner, that the lower parts were covered with

the latter will be discovered on dissection.

If linen has been prepared for the reception of the child, we may presume that it was not the intention of the mother to destroy it. It is,

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water, she brought forth three puppies, which were accordingly received into a liquid as warm as they had left. After washing them in this water, I removed them, without giving them time to breathe, into a smaller tub filled with warm milk. In this they were kept immersed above half an hour, and when taken out they were all found alive. They began to breathe, and to discharge some moisture by the mouth. Having allowed them to respire for half an hour, I again put them into warm milk, and left them a second half-hour; at the expiration of which, two of them were taken out vigorous, and seemingly nowise incommoded, but the third appeared rather in a languishing state. After allowing the other two about an hour to breathe, I put them once more into the warm milk, in which they remained another half-hour; whether they swallowed any of this liquor or not, is uncertain, but on being taken out they appeared nearly as vigorous as ever. This experiment I never carried farther, but I saw enough to convince me that respiration is less necessary to a new-born, than a grown animal, and that it might be possible, with proper precautions, to keep the foramen ovale from being closed, and thus produce excellent divers, or different kinds of amphibious animals, which might live equally in air or in water."

however, not uncommon, that a woman is delivered before her time, unprepared for its accommodation, or she may be deceived as to her pregnancy, or mistaken in her reckoning, which is a frequent occurrence. If the labour is difficult, or the presentation unnatural, a child may die during its birth, or immediately after, either from the injury it has received, or from the fatigue and exhaustion it has undergone, during a protracted labour. Roederer,* and others, think that the whole of the thorax must be expelled from the vagina before respiration can take place; but Dr. Hunter says, "a child will commonly breathe as soon as its mouth is born, or protruded from the mother; and in that case may lose its life before the body is born." It may not have reached its full time; and whether it has or not, is a question not always easy to ascertain, for a child at eight months often closely resembles one at nine; but as a child at eight months generally lives, the question is not of importance; for, if it is much younger, its diminutive size or imperfect formation will be evident: it may, however, though of full growth, be imperfectly formed; the heart, or organs of respiration, may be in an unnatural state, or the urinary passages or anus be imperforated; swellings, or accumulations of mucus, may have closed the trachea, and prevented respiration. Wounds, bruises, and other marks of violence are nearly the same in appearance as in adults; but it should be remembered, that the heads of new-born children are generally swelled after a hard labour. It is possible that a pin, or other sharp instrument, may have been thrust into the brain, spinal marrow, or heart; it is proper, therefore, that any appearance of puncture should be examined and minutely traced. The state of the mother should be inquired into; if there has been any unnatural flooding, by which it is declared that the child was drowned, or by which she was rendered unable to succour it, or render it the necessary assistance, she will be found pale, weak, and œdematous; the quantity of blood lost should be ascertained, and compared with the discharges usual in parturition. Fainting, convulsions, and delirium, sometimes attend labour, and may take place before it is perfected, which will, of course, render the mother unable to prevent the child from falling, bleeding to death, or being suffocated.

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* Opuscula Medica.

It is very important to ascertain, whether or not the *funis* or *cord* was tied; it should be done immediately the child begins to breathe, and if neglected, it is generally believed that it will bleed to death: if no ligature be made on the mother's side, it is of no great importance, as but little hemorrhage will ensue; it has been contended, that it is not necessary, even on the part of the child. Schultzius, professor in the University of Halle, in Saxony, mentions some cases were the cord was not tied, yet no hemorrhage followed; and it is certain, that many similar cases have occurred, where the vessels have closed by their own contractile power: this question does not, however, appear to have been decided. Rose says the ligature of the umbilical cord, is not, in all cases, indispensable: under favourable circumstances it may remain untied without any considerable hemorrhage; but it would be wrong to conclude that the ligature is always superfluous, as there are not wanting examples where a mortal loss of blood has been the consequence of this omission; it is impossible, therefore, to generalise on this subject.* No ligature is necessary on the *funis* of other animals. If the cord is ruptured instead of being cut, it is not so likely that the child will bleed to death, as the mouths of the vessels will contract. The nearer the cord is cut to the abdomen of the infant, the greater will be the hemorrhage if it be not tied.

If, on opening the body of the child, the heart and principal veins contain the usual quantity of blood, we may conclude that its death was not occasioned by hemorrhage, whether the cord was tied or not. An artful woman may let the child die of hemorrhage, and then apply the ligature; this may be ascertained by the emptiness of the veins and heart, and the small quantity of blood found on dissection.

These appearances, however, are no proof that the child has been murdered. We may fairly presume, that a very young woman is ignorant of the necessity of a ligature, or she may have swooned, and tied the cord as soon as she was able, though too late to save the life of her infant. Violent hemorrhage may have taken place from the uterine vessels of the mother *before* the birth of the fœtus, which may thereby be exhausted of blood; the vessels of the cord itself are sometimes burst, and blood found in the uterus.* The throat and trachea should be examined, as extraneous substances are sometimes thrust into them, or the passages may be stopped by preternatural swellings, adhesions, or collections of mucus. The child may have died of convulsions, epilepsy, or other diseases, the cause of which is not evident. Suddenly bending or turning the neck, sometimes occasions death.† New-born infants are very subject to convulsions, and in children a few months old, they are the frequent consequence of worms, teething, and diseases of the bowels. Introsusception, to which young children are very liable, may be the cause of death, which will be ascertained by dissection.

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* Manuel d'Autopsie Cadaverique par Dr. Rose, traduit de l'Allemand par. C. C. Marc, Paris, 1808.

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* Burns's Principles of Midwifery, p. 130.

† Mahon.

Whether or not the child was born alive; whether it was alive at the commencement of labour; or whether it ever breathed; are questions of great importance to determine, but of difficult solution.

It may be proper here to give a concise description of the means by which the fœtus is nourished. The circulation of the blood, and the structure of the heart, in the fœtus, is different from the adult, which difference disappears a short time after birth. The heart may be said to consist of only two cavities, and the circulation in the fœtus in utero is similar to that of a fish, which animal has a single heart; the foramen ovale making the two auricles equivalent to one only, and the ductus arteriosus, by carrying the greatest part of the blood to the aorta, rendering the two ventricles nearly equivalent to one. Not being able to respire, the blood which is conveyed to the heart through the umbilical cord acquires its oxygen in the lungs of the mother. The cord consists of two arteries and one vein; the latter conveys pure blood from the placenta for the nourishment of the fœtus, and the superabundant part is returned through the arteries to the vessels of the mother.

The usual length of the cord is about two feet, but this frequently varies; when it is too long, it sometimes surrounds the neck of the fœtus, and strangles it. The cord may be knotted, and by that means the circulation through its vessels impeded; this, however, is a very rare occurrence; instances of it are recorded by Smellie, Dr. Hunter, and Mauriceau. The vessels of the cord sometimes become varicose, and form very considerable tumors. These occasionally, so far impede the circulation, as to interfere with the growth of the child, or even to destroy it altogether.*

The presentation of the funus at the commencement of labour, is by no means uncommon; and, being subjected to pressure, the circulation through its cavities is obstructed, and the life of the child destroyed, unless it is speedily assisted. It becomes black in the face like one strangled or drowned.† In cases of breach presentation, the cord is sometimes so much pressed that the child is suffocated, and it is often in this case laid aside as dead; but if proper means are employed to set the lungs and heart into motion, animation may be restored after its suspension for a very considerable time.

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* Burns's Midwifery, p. 130.

† Bell's Anatomy, vol. ii. p. 187.

The fœtus participates in many of the diseases of the mother, and may die unborn, of small-pox, fever, and probably many other complaints. When it dies in the womb before birth, it diminishes in size, loses its sanguineous colour, becomes livid, and putrefaction commences, which is particularly observable about the umbilicus, but does not take place so speedily in the uterus, as out of it.

The premature obliteration of the *foramen ovale* has been supposed to be a frequent cause of the death of the fœtus in utero. "This state," says Corvisart, speaking of the occlusion of the foramen ovale in the fœtus, "has been less frequently noticed than its open state after birth; a circumstance doubtless arising from still-born children and those who die soon after delivery, being but rarely opened."—page 268.

There are many presumptive, but no certain signs that a new-born child has breathed. The principal criterion by which this important question has been attempted to be decided, is the floating or sinking of the lungs in water; this, however, is by no means decisive. If the lungs have ever been filled with air, they are never again entirely free from it, and will swim when thrown into water: it is presumed that, if the child has not breathed, they will sink; but this evidence is not to be depended upon, as putrefaction may have commenced, which, by generating air, will cause them to swim; or a tender mother may have blown into the mouth of her child, with the view of rousing the latent spark of life, and thus have inflated the lungs. Instances have been related, on apparently good authority, of children crying in the womb, which, of course, supposes inspiration to have taken place; and Bohn says he has witnessed an instance of it; Ficker, a German writer, also makes the same assertion, but the fact requires better testimony:* that they sometimes cry loudly immediately the head is born, and before the protrusion of the shoulders is well attested.

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* See Appendix, note C.

The scirrhus, inflamed, or ulcerated lungs of consumptive persons, and those that have been violently inflated after death,* often sink in water; but healthy lungs, that have been *completely* inflated, always float. Heister says he has seen them sink when the child has breathed twenty hours; they may, therefore, be only partially inflated.† Haller has observed, that when children had breathed only a short time, their lungs sank in water: one lung sometimes swims, whilst the other sinks. Portal accounts for this, by supposing that air enters the left lung with greater difficulty than the right, owing to the passage to the left lung being somewhat more circuitous than the right: this theory is probable, and seems to have been justified by experiment. It has been supposed impossible to inflate the lungs artificially, till natural respiration has taken place: but, though it requires some force, there is no doubt it may be accomplished, if the nostrils are first closed. The experiments of Bohn and Camper are decisive on this subject.

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* Stoll, Ratio Medendi.

† *Marc*, in his Appendix to the Manuel d'Autopsie Cadaverique, says, "Lorsque des enfans ont vécu des heures entires après leur naissance, qu'ils ont même crié et que néanmoins l'expérience pulmonaire décide contre la vitalité de ces individus."

Buttner asserts, that when the lungs are thus artificially inflated after the death of a child that has never breathed, the pulmonary arteries and veins are empty and collapsed; but if natural inspiration has once taken place, they are found full of blood, unless the child has died of hemorrhage, in which case they will be found empty in common with the whole vascular system.

The lungs of a fœtus that has never respired may be buoyed in water by the air generated by incipient putrefaction. By some experiments made by Haller and Fabricius, it was proved that lungs, which sank in water, were gradually raised to the surface as putrefaction advanced: but this is not always the case; as Morgagni, Camper, Zuchmeyer, and others, have found that putrefying lungs sometimes sink. The results, therefore, are not to be considered uniform. Whole bodies, which sink when drowned, gradually rise to the surface as putrefaction begins; but when they arrive at a certain state (probably when the solids are sufficiently decayed to let out the air contained in the cavities), they sink again. When we propose to try if the lungs float in water, we should, as far as possible, ascertain whether or not they are in any degree putrid; they should be first immersed in the water whole, and afterwards cut into pieces, and thrown in; we may, perhaps, find that some portions will swim whilst others sink. Putrefaction does not begin so soon in the lungs as in any other part of the body, owing to the firmness of the membranous cells, which constitute the greater part of their substance.

" If the air which is in them be that of respiration, the air-bubbles will hardly be visible to the naked eye; but if the air-bubbles be large, or if they run in lines along the fissures, between the component *lobuli* of the lungs, the air is certainly emphysematous, and not air which had been taken in by breathing."*

When respiration has taken place, the diaphragm and abdominal viscera are depressed, and the lungs are enlarged; they are also of a brighter pink colour than before they have been in contact with air; but on this criterion we cannot rely.

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* Dr. Hunter.

The closure of the foramen ovale is considered a strong proof, and the most certain method of ascertaining, that the child has breathed; but I think no confidence whatever is to be placed in this criterion in very recently born children; for it does not always close immediately after birth, and sometimes remains open for several years. "Soon after delivery the foramen ovale, ductus arteriosus and venosus, with the umbilical vein and arteries, begin to contract, and are in general completely closed, and the vessels shrivelled into ligaments within a *year* after birth."*† It has been found to have been obliterated before birth, which accident (as has been before observed) is supposed to be sometimes the cause of death in the fœtus.

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* Fyfe's Compendium of the Anatomy of the Human Body, vol. ii. p. 181.

† See Appendix, note D.

M. Ploucquet has proposed a method of determining whether or not a child was born alive, by ascertaining the comparative gravity of the lungs: he has found, that when a child has reached its full time, but has not breathed, the weight of the lungs, in proportion to that of the body, is as 1 to 67 or 70; but that, after respiration, the lungs double their weight, and become as 2 to 70.

This method of proof must be very fallacious, as the capacity of the thorax, and its proportion to other parts of the body, vary greatly, as every person, who is in the habit of seeing infants, must know.

We should be careful not to mistake natural and common appearances for marks of violence. The sutures and fontanelle have been mistaken for fractures of the skull; an instance of which occurred a few years ago, and the accused person would probably have fallen a victim to the ignorance and hasty conclusions of the medical evidence, had she not fortunately been supported by the testimony of a more experienced surgeon.

It is shocking to think how many innocent persons may have been sacrificed by such precipitate and erroneous judgment.

The skull of a young infant is not very easily fractured, as the bones of which it is composed, not being firmly united, yield to pressure. Where fracture is suspected, it should be ascertained by means of the scalpel, and no conclusions drawn on surmise only.

It is possible that an irregularity and variety in the distribution of the sutures, particularly in adults, might be mistaken by an inattentive observer for fracture. The lambdoidal suture is sometimes very irregular, being made up of many small sutures which surround so many little bones, which are occasionally found in other sutures as well as the lambdoidal, and sometimes seen on one table of the skull and not on the other.*

It is important to ascertain whether or not a child has been retained in the womb the full period of gestation, of which we can form an imperfect judgment only, by its size, the perfection of its limbs and extremities, its hair and nails, and the firmness and solidity of its bones and muscles; but a fœtus at eight months is often perfect and well proportioned. It has been attempted to decide this question by the relative length and weight of the child, but this appears to be fallacious. Some have supposed* that a perfect child at its full time should weigh eleven or twelve pounds, avoirdupois; that a fœtus at eight months commonly weighs seven or eight pounds; and at seven only about four pounds. Others† have estimated its weight at seven or eight, or at most ten pounds: others again as low as six or seven pounds, and its length from seventeen to twenty-one inches. Mr. Burns ‡ says that a fœtus in the sixth month measures eight or nine inches, in the seventh about a foot, and in the eighth about fifteen inches. Dr. Hunter states¶ that of several thousand new-born and perfect children which were weighed at the British Hospital, the smallest was about four pounds, and the largest about eleven pounds two ounces; but by far the greater number were from five to eight pounds, avoirdupois. He adds, that he never knew an instance of a child born at the natural period weighing twelve pounds. Of sixty male and sixty female children, born at the full time, which were weighed by Dr. Clarke,* the lightest was four pounds, and the heaviest ten pounds; he found that the average weight of the males was seven pounds five ounces and seven drachms, avoirdupois; that of the females only six pounds eleven ounces and six drachms. The average weight of the fœtus at the full period, therefore, may be estimated at about seven pounds, avoirdupois. As it appears, then, that the weight of new-born children varies exceedingly, evidence founded on such uncertain principles ought to be very cautiously admitted in a court of justice.

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* Monro's Anatomy of the Human Bones.

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* Mahon.

† Manuel d'Autopsie Cadaverique, p. 97.

‡ Principles of Midwifery, p. 121.

¶ Anatomical Description of the Gravid Uterus, p. 68.

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* Philosophical Transactions, 1786.

ABORTION.

Abortion is more common in women than in other animals, in consequence, it has been supposed, of the erect position of their bodies. It may be accidental, and the spontaneous effect of nature, or produced by medicines, or the application of violent means to the body. Aristotle proposed, as a means of checking the increase of population, in countries where the custom of exposing infants on the banks of rivers (as is said to prevail in China)* is prohibited, that the women should be made to miscarry before the fœtus be formed.† For the same purpose religion has been made subservient to a policy inconsistent with the dictates of nature and humanity: thus the religion of the island of Formosa‡ prohibits women becoming mothers before they are thirty-five years of age, and if they are pregnant before that time, the priestess, by bruising the belly, procures abortion. This crime was practised by the Romans, and is hinted at by Juvenal, Sat. vi. verse 595.; and by Ovid, who says—

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* The frequency of this custom is doubted by modern travellers.—See Ellis's Journal of an Embassy to China, p. 431.

† Aristotle de Republica, lib. vii. cap. 16.

‡ Collection of Voyages, that contributed to the establishment of the East India Company, vol. i. part i. pp. 182 and 188.

> "At teneræ faciunt sed non impune puellœ,
> Sœpe suos utero quæ necat ipsa perit;"

and is declaimed against by Tertullian. The Hebrew law punished the perpetration of this offence with heavy exactions, and with death, if the mother lost her life in consequence of it. The Roman Emperor, at a congress held at Constantinople in 692, ordained, that it should be punished with the same rigour as homicide; and severe statutes were enacted against it by the Emperor Antonine, as early as the 161st year of the Christian era. The ancient Greek legislators also prohibited the practice. By the laws of most countries this crime is punished with more severity if committed after the quickening of the child, than before. The Roman penal code made the same distinction. "Life, in the contemplation of the English law, begins as soon as a child is able to stir in its mother's womb; for, if a woman be quick with child, and any one, by a potion or otherwise, killeth it in her womb, or beat her, whereby the child dieth in her body, and she is delivered of a dead child, this, though not murder, was, by the ancient law, homicide; but the modern law does not look upon this offence in quite so atrocious a light, but merely a heinous misdemeanor; but if the child be born alive, and afterwards die in consequence of the potion or beating, it will be murder:"* but since this law was made, another has been framed, which ordains that, "if any person, after the year 1803, shall wilfully and maliciously administer to, or cause to be administered to, or take any medicine, drug, or other substance or thing whatsoever, or use, or cause to be used or employed, any instrument, &c. with intent to procure the miscarriage of any woman, *not being*, or not being proved to be, *quick* with child at the time of committing such thing, or using such means, then, and in every such case, the persons so offending, their counsellors, aiders, and abettors shall be, and are declared guilty of felony, and shall be liable to be fined, imprisoned, set in and upon the pillory, publicly or privately whipped, or transported beyond the seas for any term not exceeding fourteen years." The same act ordains that administering medicines, drugs, &c. or using means with the *intent* to procure abortion, *after quickening*, shall be punishable with death.*

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* See Blackstone's Commentaries, vol. i. p. 129.

Quickening takes place about the eighteenth week, near which time the mother feels the motion of the child, but never before: this operation does not, as has been commonly believed, consist in any definite change or alteration in the structure or animation of the embryo, but merely in the rising of the uterus (now too large to be contained in the pelvis) into the abdomen. It is probable that the fœtus is animated at the moment of conception, and the crime committed then, is morally as great as at any other period of pregnancy. The law of Scotland considers the fœtus in utero not quick, as merely " pars viscerum matris:" this, however, is a manifest absurdity.

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* See Statutes at Large, 43 Geo. III. cap. 28.

Abortion, or, more properly speaking, premature labour, is sometimes, in cases of malformation of the pelvis, produced by skilful midwives, whereby the life of the mother is saved, and sometimes that of the child. There have been, and still are, different opinions as to the propriety of performing this operation; but it is surely both legally and morally right, rather to save a certain and valuable life, than risk it for an uncertain one: its propriety is sanctioned by humanity, policy, and justice. A fœtus, born before the seventh month, seldom lives; but Brouzet, quoted by Mahon, says, a child born at the fifth month, and very small, with its eyes shut, could scarcely breathe; warmth and slight motion only indicated that it lived; it had no evacuations, nor did it cry; for four months it continued in nearly the same state, and then began to move more strongly, to cry, and have evacuations, to take the nipple, and be like other children; and, when sixteen years old, was stouter than others of its age.*

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* There is another case, recorded by Dr. Rodman in the eleventh volume of the Edinburgh Medical Journal.

Spontaneous, or accidental abortion, may be caused by grief, fright, exercise, or peculiarity of constitution. The strongest and the weakest women are most subject to abortion; the first, because they are the most plethoric; the latter, because they are the most irritable, and subject to fluor albus; it is sometimes occasioned, unintentionally, by bleeding largely, which frequently makes a woman miscarry. A diseased state of the uterus or placenta, or of the child itself, may have the same effect; the fœtus may have the small-pox, dropsy, and probably many other diseases, in the uterus. Women sometimes miscarry from sympathy: if a pregnant woman sees another in labour, her pains sometimes come on, and she is prematurely delivered.*

Abortion may be procured by violent means, as blows on the abdomen stimulating the uterus into action, or causing inflammation or profuse hemorrhage, or by the introduction of sharp instruments into the uterus itself, by means of which, the membranes are ruptured; and if the operator is unskilful, the head of the child is so much wounded as to occasion its death: the mother, also, generally falls a sacrifice, as this crime is usually committed by ignorant people, who, directing the instrument improperly, wound the uterus.

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* Dr. Clarke's Lectures.

Certain medicines taken into the stomach, will also frequently cause abortion: these are drastic purges, strong emetics, and that class of medicines called *emmenagogues*.

Electricity will also have the same effect. There is, however, no drug which will produce miscarriage in women not predisposed to it, without acting violently on their system, and probably endangering their lives. Some will bear the full action of these drugs, and bring forth their burden in due time, whilst others have so strong a tendency to abortion, that it is impossible to prevent it, even with the utmost care. When abortion takes place in the early months of pregnancy, it is with difficulty discovered after death by dissection; for the traces it leaves are small: neither the uterus nor the abdomen are much distended, and the hemorrhage proceeding from small vessels is seldom very profuse; but if it takes place in the middle, or towards the latter end of pregnancy, it may be known by the following signs: if the woman survives, the breasts will generally be found to contain milk, are distended or flaccid; the areolæ of the nipples are larger and darker coloured than usual, and are studded with sebaceous follicles, and the hemorrhage (coming from large vessels) will be considerable; a fetid discharge, mixed with clots or mucus, is observed to issue from the vagina, which is sufficiently dilated to admit the hand; the os uteri is open, and inclining downwards, and the skin of the abdomen pendulous, wrinkled, and flaccid; the labia soft, red, and inflated, and a few hours after delivery pains are felt about the uterus.

The linen should be examined, as there is, after abortion or delivery, an hemorrhage, which is generally more in quantity, and continues longer than the menstrual flux, and leaves the body in a languid, relaxed state, which is not a consequence of the menses. In some strong women these effects are so slight, that their strength does not appear to be diminished, and the parts recover their tone in a very short time, and in general after eight or ten days, it is impossible to ascertain whether pregnancy has existed or not. These appearances, however, are not always to be relied upon as evidence; they may arise from external violence; and the flaccid state of the skin of the abdomen may be the consequence of dropsy.

Dissection.

If a woman die in consequence of delivery or miscarriage, in addition to the appearances just mentioned, the uterus will be found thicker and more capacious than is usual when it has not been impregnated; the traces of the adhesion of the placenta to its unequal internal surface, may be distinguished; its neck will be relaxed, and the vagina considerably dilated: these circumstances are more or less apparent, according to the advanced state of the pregnancy, and are the same, whether the abortion has happened spontaneously or has been procured by violent means. It may be supposed that the distention of the uterus might arise from hydatids,* or moles, and the inequality of its internal surface, occasioned by their attachment; the relaxation may also have been the consequence of flooding. These, like other irritations of the womb, may occasion enlargement of the breasts and secretion of milky or watery fluid.* The appendages of the uterus should be examined, and particularly the ovaria. The ligamenta rotunda are relaxed, and the ligamenta lata are nearly effaced during gestation, as they furnish the uterus with part of its external covering.† But the most certain proof has been supposed to be derived from the examination of the ovaria, where, during gestation, and a short time after delivery, a granulous substance will be found, called *corpus luteum*, which vanishes soon after parturition, but leaves a scar for life. Dr. Hooper, however, says that these marks sometimes exist in virgins; and Dr. Denman thinks they are found in salacious women, who have never been impregnated. Vallisneri asserts, that he has seen corpora lutea in virgins, and Blumenbach thinks, they may be produced by indulging in the Lesbian passion.* Upon examining the ovaria of several women who had died virgins, and in whom the hymen was too perfect to admit of the possibility of impregnation, there were not only distinct corpora lutea, but also small cavities round the edge of the ovarium, evidently left by ova that had passed out at some former period, so that this happens during the state of virginity.†

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* See a remarkable trial at Lancaster, in Sept. 1808, for the supposed murder of Miss Burns, and the pamphlets which it gave rise to.

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* Burns's Principles of Midwifery, p. 85.

† Fyfe's Anatomy.

Moles, or disorganized masses of flesh, have been discharged from the uterus, without either embryo or umbilical cord,‡ during the growth of which, all the symptoms of pregnancy have been experienced. This is, probably, always the effect of impregnation;¶ and were it to occur to an unmarried female, who is suspected of having delivered herself privately, and destroyed her child, her character would be materially affected, but her life not endangered; as, by the English law, it is necessary that the body of the child be found before the coroner can hold an inquest. In a case of this kind the placental mark would be discovered after death, which, though no evidence that an organized fœtus has been expelled, may be considered a proof of conception.

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* See Comment. Soc. reg. Scientiarum Gotting. vol. ix. p. 109, et seq.

† Sir Everard Home, in Philosoph. Transact. for 1817, part ii.

‡ See Mr. Lemon's case in the eleventh volume of the Edinburgh Medical Journal.

¶ Zacchæus, however, is of a different opinion; he says, "Cum plerique doctorum hominum suspicati fuerint, imo pro certo habuerint, molam non posse absque viri concubitu gigni; contra tamen, sentientibus aliis doctissimis pariter ac præcipue auctoritatis viris. Quæst. Medico-Legales.

It is of consequence to ascertain whether abortion or premature labour has taken place accidentally, or been produced by violent means: if it has been occasioned by blows, or the introduction of sharp instruments into the uterus, unless skilfully performed, the bodies of the woman and child will be found punctured, bruised, or lacerated: if by taking improper drugs, employing large bleedings, or other means, which are known to procure abortion, we must depend on circumstantial evidence; this, however, is the province of a jury; but, as laxative medicines and small bleedings are often used with great advantage during pregnancy (though they sometimes occasion abortion), we should be careful how we conclude that it has been caused intentionally.

Miscarriages sometimes arise from a diseased state of the placenta and umbilical cord. Grief and other depressing passions, under which a woman, who is conscious that she is about to give birth to a bastard child, may be presumed to labour, may also be the cause of abortion.

RAPE.

Rape is considered by the laws of all countries, a crime of a most heinous description, and has in all times been severely punished. The punishment has varied in different ages. In this country, the criminal was formerly adjudged "amittere oculos quibus virginem concupivit; amittere etiam testiculos qui calorem stupri induxerunt." In the early part of the reign of Edward the First, it was deemed a trespass only, and punished by fine and imprisonment; it was afterwards made felony, and, in the reign of Elizabeth, excluded from benefit of clergy. Aiders and abettors are deemed principals, and amenable as such. By the Roman laws it was regarded as a capital offence, and the effects of the criminal were confiscated. The Mosaic laws punished this crime with death.

The evidence in cases of rape generally rests with the female alone, who is allowed by the laws to be a competent witness, if she be of sufficient age and understanding to know the nature and obligation of an oath, and to discriminate between right and wrong, discover the offence soon after commission, and made outcry if it was possible that she could be heard, unless restrained by menaces, and her testimony has weight according to her character and credibility. By the Scotch law the complaint must be made in twenty-four hours; in England there is no limited time. It is an accusation difficult to be defended, even though the accused be innocent, as the accuser has the advantage of supporting it by a direct and positive oath, but the defence can only be collected from circumstances.

Rape may be attempted, perfected without the consent of the female, in certain cases, as in infancy, &c. perfected with her consent; imputed or pretended.

An assault with intent to commit a rape, without having accomplished it, is a heinous misdemeanor, but punishable only as an assault and battery; but if a woman kills him that assaults to ravish her, it is no felony.*

To constitute perfect rape, some degree of penetration, and also of emission, must be proved, or collected from circumstances, although it is well known that many women *amore consuetæ*, are insensible of the *emissio seminis in corpore*, even when the coitus is complete, and can judge that it has taken place only by the unusual moisture of the parts. A modest and inexperienced virgin, therefore, ignorant that such an event would ensue, overcome by terror and agitation, or insensible from syncope, can hardly be expected to give decisive evidence on this point, and Lord Hale says, the *least* penetration maketh it rape, although there be not *emissio seminis.*[*] Of late it has been held sufficient if the prosecutrix swear that the defendant had knowledge of her person against her consent, or carnal knowledge of her as her husband had,[†] and many precedents may be quoted where this evidence was deemed sufficient. If the injured person was a virgin, some injury is usually done to the pudenda, which can only be discovered soon after the commission of the crime. This injury consists in rupture of the hymen, swelling, inflammation, or laceration of the parts, and generally some discharge of blood: laceration of the perineum is said sometimes to have been occasioned in very young persons.

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* Hale's Pleas, 37.

It is generally agreed, that these effects indicate defloration; but they do not prove rape, as they may occur when the connexion has been with the consent of the female, or they may have been caused by disease. Dr. Percival mentions a case, where inflammation of the pudenda, and symptoms of defloration, occurred in a child four years old, which caused her death; it was suspected that she was injured by a boy of fourteen, who was accordingly taken into custody: but several other similar cases being received into the hospital soon after, the medical men were induced to change their opinions.

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[*] 1 Pleas of the Crown, 630.

[†] See Mac Nally on the Rules of Evidence, vol. ii. p. 606.

These signs, therefore, must be considered uncertain. The absence of the hymen is no proof of defloration, as this membrane may have been destroyed by disease, by noxious habits, or acrimonious discharges. Tolberg* records an instance of its resembling the carunculæ myrtiformes, in its original formation, and some authors have considered it an unnatural adjunct to the body, and have attributed its formation to disease.† Graaf, Pineus, Buffon, Dionis, and others, even doubt the existence of such membrane, and declare, that, by dissection of girls of all ages, they have never been able to discover it. It has been asserted by good authority, that it is not always ruptured in coitu. Ruysch affirms, that if the coitus takes place immediately after the menstrual excretion, this membrane is often not ruptured;[*] the same author says he was called to a woman who could not be delivered of her child, and on examination found that the hymen was entire, and so strong that it prevented the descent of the child's head; he divided it with his scissars, and the birth took place.[†][‡] After a hard labour, attended with much inflammation of the parts, a membrane resembling the hymen has been formed by cohesion. Guillemeau mentions the case of a woman under suspicion of unnatural formation, where on examination by several eminent surgeons, the vagina was found blocked up by a strong hard membrane, which being divided, the passage became open; but the woman was declared to be at that time pregnant, and was delivered four months after of a full grown child. Hildanus, in his Chirurgical Observations, quotes a similar case. It has been supposed that a woman will not conceive if the coitus has been against her consent; this, however, may be doubted,* and the woman's conceiving does not excuse the ravisher. Harvey, and others have believed, that penetration to any extent, and injection of semen into the uterus are not necessary to cause conception, and have doubted whether it ever enters the uterus; although in dogs and rabbits killed immediately after impregnation, and in a woman, dissected by Ruysch, who was killed in the act of adultery, semen was found both in the uterus and fallopian tubes. They have supposed that the semen is absorbed; in support of which they adduce the above-mentioned facts of women and other females who have conceived, although from peculiar circumstances they never could have completely copulated.† It

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* De Varietate Hymenum.

† Appendix, note E.

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[*] Observ. Anatom. Chirurg. xxii.

[†] Observation 22.

[‡] Similar cases are recorded by Riolan, by Dr. Simpson in the Edinburgh Med. Essays, Haller, in the 8th vol. of his Elementa Physiologiæ; and since the first edition of this work was published, a case has been inserted by Dr. Squire, in the Transactions of the Medical Society of London.

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[*] Eæ quæ possunt absque dedecore fateri, confirmant, se absque grato sensu concepisse.—Haller Elem. Physiol. 8, p. 23. Sir Matthew Hale says (but it does not appear from what authority) "Mulier enim vi oppressa concipere protest." Hist. Placitorum Coronæ i. p. 631.

[†] See Appendix, note F.

has been doubted whether or not a woman can conceive twice by connection with different men soon after each other. After impregnation the mouth of the uterus is closed, so that superfœtation, strictly speaking, cannot in that case take place; but that a second conception may be caused very soon after the first is proved by adulterous women, who have brought forth children resembling different fathers; black women who have brought forth a black and a mulatto, and white women, who have given birth at the same time to a white and a mulatto.*

The effusion of blood, though required by the Mosaic law as an evidence of virginity,† and often believed to be such, certainly is not. Buffon says, "I can with confidence maintain, that when a girl has conversed with a man before puberty, there is no effusion of blood, provided the disproportion of the parts has not been too great, or the efforts have not been too violent. At full puberty, on the contrary, that effusion often happens even from trifling causes, especially if she is of a full habit, and regular. The sign of virginity is rarely observed in such as are meager, or subject to the fluor albus; and what evidently proves it to be fallacious, is the frequency of its repetition. In some women, four and even five times has this pretended virginity been renewed in the space of two or three years; this renovation, however, only happens from the fourteenth to the eighteenth year."*

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* Buffon's Nat. Hist. vol. iii.

† This evidence is still required by the laws of some of the tribes inhabiting the banks of the Indus.—See Pottinger's Travels in Sinde, p. 70.

It has been asserted, that the perinæum is much smaller in women who have been deflowered than in virgins.†

The effusion of blood, which is sometimes very considerable, is liable to be confounded with the *catamenia*, or menstrual evacuation. The nature of this fluid has not been accurately ascertained, nor do we know whether it is blood, properly so called, or a secretion from the vessels of the uterus. Some physiologists deem it to be blood deprived of its fibrin, others, a secretion *sui generis;* and, *Richerand* asserts, that it is common arterial blood. It is supposed, however, to have this peculiarity, that in its natural state it does not coagulate; but it is well known that when the discharge is superabundant and attended with great pain, it often comes away in coagula or clots; whether this is the pure menstrual discharge, or an admixture of common blood, I will not take upon myself to determine, but on the testimony of many women I can safely affirm, that coagula are by no means a rare occurrence.

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* Buffon's Natural History, vol. iv. chap. 3d.—I need scarcely say, that the marks of newly lost virginity, mentioned by some authors, viz. swelling of the neck, rings round the eyes, the colour of the skin and urine, &c. are absurd, and still more so, the silly story credited by Mahon, of a monk at Prague, who could tell a maid by the smell.

† See evidence of Dr. Ford in the trial of Lord Baltimore, for rape, in 1768.

Rape cannot be perfected without the exertion of much violence, unless the woman be subdued by menaces, or intoxicated with drugs or spirituous liquors; it is therefore, proper to examine the state of other parts of the body, and particularly the clothes, where, if the crime has been recently committed, any marks of force that may have been used, will probably be discovered.

If the ravishment be committed on a child under ten years of age, even *with* her consent, it is deemed a rape, and in the eye of the law is equally felonious, as she is supposed to be of insufficient judgment. Sir Matthew Hale is of opinion, that such profligacy committed on an infant under twelve years, the age of discretion by common law, either with or without consent, amounts to rape and felony; but the decisions of the court have generally been founded on the statute of Queen Elizabeth above mentioned. A male infant under the age of fourteen years, is presumed by law incapable of committing a rape, and cannot be found guilty of it; but there is no doubt it may be committed by boys under this age, without any unnatural precocity.

Justinian has fixed puberty at fourteen years in boys and twelve in girls, but the Scriptures inform us, that Achaz begat Ezekias at ten years, and Solomon became the father of Roboam at eleven.

There are examples of boys who have propagated at eight, nine, and ten years of age, and of girls who have conceived at seven and eight.[*] Professor Blumenbach records an instance of procreation in a Swiss girl in her ninth year,[†] and I have myself met with two instances of regular return of the catamenia and partial developement of the breasts at six years of age; one of these was exhibited on the stage a few years ago as a juvenile actress. A very remarkable case of precocious virility in a male child, three years of age, is to be found in the first volume of the Medico-Chirurgical Transactions; but such facts are exceedingly rare, and should be classed as singular phenomena.

When rape has been committed, gonorrhœa or lues are sometimes communicated, and if the accused does not appear to be affected with these diseases, it may be presumed that the imputation is ungrounded. It was, however, the opinion of Mr. J. Hunter, and has been corroborated by the observation of other surgeons, that a person, in whom no appearances of existing venereal affection can be discovered, may communicate disease to others.

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[*] Buffon's Nat. Hist. vol. iv. chap. 3.

[†] Biblioth. Med. vol. i. p. 558; and a case, probably the same, is mentioned by Haller.

Women labouring under leucorrhœa may impart a discharge to the male; and the latter affected by a gleety discharge in consequence of strictures and other irritations, in the urethra may affect the female.*

In cases of *pretended* rape, the proof generally rests more on circumstantial than medical evidence, as the person bringing the charge must be of a bad, abandoned character; it is, however, felony to force a harlot: there are instances of accusations of this kind being brought by women, who, to give the appearance of violence having been committed, have used acrid and stimulating substances to produce inflammation: this, however, can seldom deceive a medical man, as the enlarged state of the vagina will sufficiently develope the character of the complainant. Sir Matthew Hale mentions two remarkable instances which occurred within his own observation, of malicious prosecution for this crime.*

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* I deliver this as the opinion of one of the most deservedly eminent surgeons and physiologists of the present time, whose name I have no authority to mention.

HANGING AND STRANGULATION.

The questions which present themselves when a body is found suspended, are, 1st, Whether the person was hanged whilst alive, or after death: 2dly, Whether he hanged himself, or was forcibly suspended by another. These questions may sometimes be difficult to determine.

When a person is hanged up alive, the mark of the cord will be evident round the neck, forming a livid depressed circle. The face, chest, shoulders, arms, and hands, are swelled and livid, and a bloody mucus issues from the mouth and nose: the eyes are red and projecting, the eyelids generally open, the tongue wounded by the convulsive motion of the jaws, and frequently thrust out of the mouth. The shoulders are raised, and ecchymosis is observed upon them, extending upon the breast and down the arms; the fingers are bent, the nails blue, and the hands nearly closed. The body does not appear so much stretched as when it has expired upon a bed. The cartilages composing the larynx are sometimes broken, and the vertebræ of the neck are often fractured or luxated, or their ligament stretched. This more commonly happens when life has been destroyed by those more violent means now adopted for the execution of criminals in this country. Urine and fæces are often involuntarily expelled, and semen sometimes emitted. When the principal indications above mentioned are present, we may conclude that the deceased has been hanged whilst alive. It is possible, that a person who is destroyed by another, may be first strangled, and afterwards suspended: if, therefore, two distinct circles formed by a cord, or the deeply impressed marks of fingers on the neck, are perceived on the person found hanging, with appearance of resistance having been made, viz. the clothes torn, the hair dishevelled, &c.

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* Hist. Placitorum Coronæ.

we may presume he has been hanged by another; but if these signs are absent, we should conclude that he has destroyed himself.

In the year 1762, John Calas, an unfortunate old man, was broken upon the wheel at Toulouse, on the supposition of having hanged his son: the young man had for some time appeared melancholy, and was found hanging in his father's house: his linen and clothes were not torn; his hair, which had that day been dressed, was *not dishevelled;* nor did there appear on him any marks of violence. The father was a most respectable man and affectionate parent, and the evidence was greatly in his favour; but being a Protestant, and his son having apostatized from the religion of his family, he fell a sacrifice to the unjust suspicion and prejudice of the populace.

The form and situation of the mark made by the rope, should be ascertained: if it is at the bottom of the neck, it has been supposed that the person has been strangled; for, if suspended, the cord would slip to the superior part of the neck.

Infants are sometimes suffocated between feather-beds, or strangled by unnatural parents pressing the trachea with the thumb and finger.

Wounds, effused blood, and marks of violence on the body, are supposed to be unequivocal signs of the deceased having been murdered; but it is possible, that swinging himself off with some violence, with the view of speedily destroying life, the rope may have broken, the body falling to the ground, or against articles of furniture may have been wounded, and the unfortunate person had resolution again to suspend himself. These circumstances, though they rarely occur, should be taken into consideration, when the life and honour of a suspected person are at stake. Circumstantial evidence will elucidate many facts which may be obscure to the medical observer. The rope should be kept, the situation of the body and surrounding objects accurately observed and noted down. As the medical man is generally among the first called in on these occasions, and his evidence being always required, it is proper that this should be done by him.

An apprentice boy in my neighbourhood,

working alone in an attic, tied one end of a rope loosely round his neck, whilst his master was from home, probably without any intention of destroying himself, and twisted the other round the projecting part of the top of a door, the planks of which were irregular and somewhat divided—a small stool, on which he stood, slipped from under him, when he fell forwards striking his temple against the corner of a box which cut him to the bone; he lay along the floor, his head and shoulders only, elevated a few inches above it; the cord not being tied, had run nearly its whole length and then caught between the planks of the door, in this state he perished. The wound was magnified by popular rumour into many, and vengeance denounced against the innocent master, who was accused of having first killed and afterwards hanged the boy; on examining the body, the mark of the cord was found to extend from ear to ear, the vessels of the brain were turgid, the thiroid cartilage broken, the nails blue, and the hands firmly closed. From this and other important circumstantial evidence, the Coroner's jury were convinced that the charge was unfounded.

It has been supposed by writers on this subject, that when the cord is extremely tight round the neck, it is an evidence of assassination, as the weight of the body will not in general be sufficient to pull it very tight: but this, I think, in a great measure depends upon the situation of the noose: if placed at the side of the neck, it would be pulled tight by the weight of the body; but if at the back of the neck, it would not.

Death by hanging is generally caused, not as has been supposed by accumulation of blood in the head and compression of the brain, but by the pressure of the cord on the trachea producing suffocation; though, in some instances, the vertebræ of the neck are dislocated, particularly as has been before mentioned by the present method of executing criminals in this country. If a trochar be inserted into the trachea of a dog, and the animal be suspended, during the time usually deemed sufficient to destroy life, he will be found to have sustained no material injury.

We have heard of some unsuccessful attempts of this kind, which have been made to preserve the lives of criminals condemned to suffer the punishment of the law: when the neck is not broken, nor the weight of the body very great, it is probable that the experiment would be successful.* Richerand says he was assured by a respectable surgeon in the Austrian army, that he had saved the life of a criminal by performing the operation of Laryngotomy a short time previous to execution.

On opening the body of a person who has been hanged, the appearances resemble those produced by drowning, with the exception of the absence of water in the bronchial cells. The right side of the heart, and the vessels of the lungs, are found full of blood, the left cavities and the arteries being almost entirely empty, and the lungs themselves do not collapse when the chest is opened. Dr. Goodwyn, in his experiments on respiration, discovered that the lungs of persons of ordinary stature who had died from hanging, contained from two hundred and fifty to two hundred and seventy cubic inches of air, whereas those who died a natural death, contained only from one hundred and twenty to one hundred and twenty-five cubic inches. The blood-vessels of the brain are distended, and sometimes ruptured; the tongue is generally wounded; and a bloody mucus often issues from the mouth.

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* It was tried on one Gordon, a Butcher, who was executed at the old Bailey, in the early part of the last century; the body having hung the usual time, was removed to a neighbouring house, where a surgeon waited to receive it and enforce every means calculated to restore animation: he opened his eyes and sighed, but soon expired: the want of success was attributed to his great weight.

DROWNING.

When a body is found in the water, the following questions present themselves:

First, Was the deceased drowned, or killed by other means, and afterwards thrown into the water?

Secondly, If he was drowned, did he destroy himself, or was he forced into the water by another?

These questions may sometimes be determined by examining the body. If there are any severe bruises or excoriations on the hands, knees, or other parts, or if the clothes have been recently torn, we may presume that violence has been inflicted, and these marks occasioned by struggling to resist it: but it should be taken into consideration, that the person may have precipitated himself into the water, and struck against a stone or other hard substance, or been driven against rocks or stakes by the force of the current, and the body been thus wounded.

Dead bodies thrown into the water before putrefaction has commenced, almost always sink, unless an unusual quantity of air be contained in the cavities to buoy them up, which may have been generated there before death. But if a strangled body be thrown into the water, the lungs being full of air, and a cord left tight about the neck, it is probable it may float by means of the included air.* Bodies float more easily in salt water than in fresh, as ships are observed to sink some inches lower in rivers than in the sea.

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* See the evidence of William Cowper the Anatomist, in the trial of Spencer Cowper, Esq. for murder.

The presence of frothy mucus in the mouth and nostrils has, from the days of Ambrose Paré to the present time, been considered a proof of the body having been submersed whilst alive, and is always observed in drowned persons. Water in the stomach is not a proof that the deceased was drowned; it is seldom found there: it is, however, generally discovered in the lungs, though in a small quantity, but probably does not enter till animation is nearly extinguished, as the epiglottis, which closes the passage to the lungs, is endued with such extreme irritability, that it closes on the approach of any extraneous matter. Larrey found water in the bronchiæ of drowned persons, and concludes that it is the cause of death in these cases. When the body is submersed after death, water is seldom found in the lungs or stomach. De Haen thought that the water flowing into the lungs is the cause of death, and acts by stopping the passage of the blood in the arteries. To disprove this, Dr. Goodwyn poured two ounces of water into the lungs of a cat, through a hole made between the cartilages of the trachea; the animal had an immediate difficulty of breathing and a feeble pulse, but lived several hours afterwards without much apparent inconvenience—it was at length strangled, and two ounces and a half of water were found in the lungs: he drowned several animals in ink and other coloured fluids, and found that a small quantity always entered the lungs, not by its own gravity after the efforts to inspire had ceased, but during their struggles to preserve life.* It has been supposed that those who are drowned die apoplectic. Dr. Cullen says, "Water very often does not enter into the lungs, nor even the stomach, in any quantity to do hurt to the system; and in general it is known that, in most cases, no hurt is done to the organization of the vital parts; it is, therefore, probable, that the death which ensues in drowned persons, is owing to the stoppage of respiration, and to the ceasing (in consequence) of the circulation of the blood, whereby the body loses its heat, and with that, the activity of the vital principle:* and this is now the generally received opinion, and is sanctioned by the experiments of Dr. Goodwyn, from which he concludes that a small quantity of water *usually* passes into the lungs in drowning, which, mixing with the pulmonary mucus, occasions the frothy appearance, but is not sufficient to produce the changes which take place in drowning: "and hence it follows that the water produces all the changes which take place in drowning, *indirectly*, by excluding the atmospheric air from the lungs." These opinions are corroborated by the experiments of M. Gauteron; he cut a hole through the trachea of a dog, and inserted a long tube into it, having muzzled him so as to prevent his biting, but allow him to swallow, the animal was submersed under water leaving the end of the tube above the surface; in this situation he remained more than a quarter of an hour, breathing through the tube, and was liberated without having sustained any injury.* It was formerly thought that if no water was found in the stomach or bronchial cells, death could not have been occasioned by drowning.†

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* See Dr. Goodwyn's essay on the connection of life with respiration, &c.

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* Dr. Cullen's letter to Lord Cathcart.

Water is sometimes found in the stomach of drowned persons, and it is probably taken in at the surface when they open their mouths for breath; and the water which rushes in they are forced to drink, to prevent its falling on the lungs; but when the head is entirely under water, it is not likely that any can enter the stomach; for, when the breath is stopped, and suffocation *commenced*, I believe a person cannot swallow, and it will not fall into the stomach by its own weight.‡ In one, therefore, who has struggled much against death, and frequently risen to the surface, it is most likely that the largest quantity of fluid will be found in the lungs and stomach.

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* Lettres sur la certitude des signes de la mort, par M. Louis.

† See the Trial of Spencer Cowper, Esq.

‡ See the evidence of Sir Hans Sloane, Dr. Garth, and W. Cowper, in the above-mentioned trial.

When the body has been but a very short time in the water, and the speedy application of the proper means fails to restore life, which is not unfrequently the case, it is probable that a larger quantity of water than usual has entered the bronchial cells, and arrested the motion of the lungs.

Blood is often found accumulated in the vessels of the brain, in the jugular veins, the right side of the heart, and in the pulmonary artery; the pulmonary veins, and the left side of the heart being empty; which seems to corroborate the opinion that the true cause of death, by drowning, is the stagnation of the blood, caused by the cessation of respiration.

Even when the body is actually dead, and all hopes of resuscitation extinguished, it is sometimes of consequence to ascertain how long it has been in the water—whether in a running stream or stagnant pool—the changes that have taken place by maceration, putrefaction, erosion by fish, &c. It is well known that when dead animal fibre is exposed, for a considerable time, to the action of a current of water, it becomes converted into a fatty substance, resembling spermaceti, called by chemists *adipocire.* The period of time required to effect this change has been the subject of dispute. At the Lent Assizes held at Warwick in the year 1805, a cause was tried which is of considerable judicial importance. A gentleman who was insolvent, left his own house with the intention (as was presumed from his recent conduct and conversation) of destroying himself. Five weeks and four days after that period, his body was found floating down a river. The face was disfigured by putrefaction, and the hair separated from the scalp by the slightest pull; but the other parts of the body were firm and white, without any putrefactive appearance. The clothes were unaltered, but the linen was exceedingly rotten. On examining the body, it was found that several parts of it were converted into adipocire.

A commission of bankruptcy having been taken out against the deceased a few days *after* he left home, it became an important question to the interest of his family, to ascertain whether or not he was living at that period. From the changes which the body had sustained, it was presumed that he had drowned himself the day he left home; and, to corroborate this presumption, the evidence of Dr. Gibbs of Bath was required, who, from his experiments on this subject, is better acquainted with it than any other person.* He stated on the trial, that he had procured a small quantity of this fatty substance by immersing the muscular parts of animals in water for a month, and that it requires five or six weeks to make it in any large quantity. Upon this evidence the jury were of opinion that the deceased was *not alive* at the time the commission was taken out, and the bankruptcy was accordingly superseded.

The appearance of a body that has been drowned is nearly the same as when death has been occasioned by hanging, viz. turgescence of the vessels of the brain and eyes, the tongue often wounded, &c. but de Haen and Morgagni say, they always found the cerebral vessels empty; this discrepancy may be accounted for by supposing, as Dr. Marc has done, that death by drowning may arise from two causes, viz. suffocation, or cerebral congestion, though he admits that in most cases they are combined.

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* See Experiments by Dr. Gibbs on Adipocire, in the Philosophical Transactions for 1794, Part II. and for 1795.

It has been asserted that the blood is always in a liquid state;* this fluidity is particularly remarkable where the blood vessels enter the substance of the bone: and when the scalp is torn from the cranium, if the blood be wiped away with a sponge, it appears again on the surface of the bone, and collects into a stream.†

According to Hebenstreit the diaphragm is found bent towards the abdomen, which is not the case in those submersed after death, and as in drowning the deceased dies on an inspiration, it must necessarily, he affirms, cause a depression of the diaphragm. The skin is remarkable for its paleness, mucus issues from the mouth and nose, and the head is often swelled. The skin of the fingers is frequently abraded by the efforts to preserve life, and to this circumstance Ambrose Paré and Bohn attribute more importance than it seems to deserve.

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* Si Homo vivus in aquam projicitur, sive consilio, sive vi, vel casu, et periit in undis, videbimus sanguinem talis hominis post mortem liquidissimum esse, et ex vena secta illius, ut aqua, fluidum copiosumque effluere; hominis autem interfecti et tunc in aquam præcipitati, sanguinem spissum tardo, et menime copiosum ex vena secta effluere. Walter, de morbis peritonæi et apoplexia.

† Manuel d' antopsie cadaverique par Docteur Rose, augmenté de Notes, &c. par Dr. Marc.

Insensibility from submersion in water is to be considered as only a suspension of the vital powers, and there are many instances of their resuscitation after the body has been immersed a considerable time. Some, however, who have been only a few minutes under water, cannot be restored even by the immediate application of the proper means. Monsieur d'Egli pretends to have reanimated a person who was under water nine hours; there are many incredible stories told on this subject, which I shall not repeat;* the longest period recorded in the Reports of the Humane Society is three quarters of an hour.

Dr. Halley thinks drowning begins in half a minute; this, however, must depend upon the habits of the person. Those who have been accustomed to dive will remain under water much longer than others; and the Indian divers employed in the pearl fisheries in the East Indies are immersed three, four, and in some instances even five minutes, without injury.* Diemerbroeck says, he saw a diver remain under water half an hour.†

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* See Kite's Essay on the Means of recovering drowned Persons.

Different methods of restoring suspended animation have been recommended by different writers on the subject.

The body should be carried carefully, with the head a little raised, to the most convenient house, placed in a warm bath, in the sun, or at a proper distance from a fire, and rubbed with hot flannels, flour of mustard, or other stimulants: heated bricks wrapped in a cloth, or bottles filled with hot water, should be applied to the hands and feet. Sinapisms, or a hot-water blister, applied to the region of the heart, would, by the stimulus they occasion, probably be of service.* Pungent salts, pepper, or snuff may be rubbed upon the nose. Breathing should be imitated by blowing air gently into the lungs, by the mouth of another person, or by means of a pair of bellows, if they can be procured, the nozzle of which should be applied to one of the nostrils, the other nostril and the mouth being closed with the hand; and when the lungs are inflated, the chest should be gently pressed to expel the air: this should be repeated for a considerable time, but discontinued immediately there is any appearance of natural breathing. Oxygen gas, collected in a bladder to which a stop-cock is affixed, and blown into the lungs, has been recommended with every probability of success.

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* See Percival's History of Ceylon.

† Anatomie, lib. ii. p. 464.

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* To make a hot-water blister, thrust a napkin into a pint cup, so as to fill it, leaving a convex surface, rising a little above the top. Let boiling water be poured on the napkin, till it is thoroughly wetted, then hastily invert it, and hold it about a minute to the part intended to be blistered. I have several times used this when I have wished to produce a speedy blister, and have found it answer the intended purpose: or vesication may be rapidly produced by the acetic acid, as recommended by Sir H. Davy.

Clysters of warm salt and water, or spirits and water, may be injected; but tobacco, either in form of smoke or infusion, should never be used, as it has a narcotic effect, and tends to destroy the irritability of the muscular fibre.

Bleeding has been recommended by physicians of eminence; but Mr. John Hunter expressly forbids it, and it is now seldom practised.

When the patient can swallow, small quantities of warm wine, or spirits and water, may be taken; but till then, nothing should ever be poured down the throat, either by a flexible catheter or otherwise.

Emetics should never be given.

Slight shocks of electricity, or a stream of galvanism, passed through the chest, promise to be of great service.

These means should be persisted in for several hours, and till there are evident signs of death, as stiffness of the limbs, dimness of the eyes, &c.

I need scarcely say, that holding the body up by the heels, violently agitating, or rolling it over a barrel, and other methods sometimes practised by the vulgar, are more likely to destroy life than to restore it.

When animation returns, the patient should not be left alone, as some have been lost from want of care, who might otherwise have been saved.

DANGEROUS INEBRIETY.

A MEDICAL man is sometimes called to a person in a state of excessive intoxication, attended with all the symptoms of apoplexy: it is often difficult to distinguish from which cause they arise, and the only method of making the discovery is by the smell of the breath, and by ascertaining in what manner the patient has spent the few last hours. Many persons die suddenly from drinking large quantities of spirits, which produce stupor, loss of reason, motion, and sensation; the motion of the heart and lungs is enfeebled and interrupted; the pulse is slow, and often irregular; there is a great determination of blood to the head; and the person either dies apoplectic, or from the sedative effect produced on the nerves of the stomach.

A brisk emetic of sulphate of zinc, or copper, in solution, ipecacuanha* or tartarised antimony, should be immediately given; and, as the power of swallowing is lost, a flexible catheter may be passed into the stomach, and the medicine by that means poured in. The irritability of the stomach being greatly diminished, the dose should be strong; the liquor in the stomach may be diluted by pouring in vinegar and water, in which any purgative may be dissolved. If these do not act properly, purging clysters may be given. Blood should be taken from the jugular vein, or temporal artery, and the quantity regulated by its effect on the pulse. The head should be washed with cold water, or æther; and the application of blisters to the head and stomach would probably be attended with benefit.

The body should be placed in an easy reclining posture, and all tight bandages removed. If it is cold, it should be rubbed with warm flannels, and the lower extremities put into a warm bath. In this case bleeding and other debilitating remedies should be avoided.

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* See page 43, note.

When the person is recovering, warm gruel, to which some spice is added, may be taken in small quantities.

CIVIL COURTS.

INSANITY.

INSANITY is such a Proteus-like disorder, and exists in such a variety of forms, that it is difficult to give it a precise definition. It may be called a delusion, or an erroneous association of ideas on particular subjects; and under this general character may be comprehended all degrees of aberration of mind, from melancholy and hypochondriacism, to the most furious mania. The two principal species into which this disease is divided, are mania and melancholia: the first characterized by uncommon excitement; the latter, by great depression. They are frequently changed from the one to the other, by the casual excitement of some passion. To these may be added, Dementia, or Fatuity, which though not properly called madness, is often the subject of judicial enquiry, and deprives the unfortunate object of it of the control of his person and property. "From idiocy, madness is readily distinguished. The idiot cannot reason, the madman reasons falsely. The idiot acts from animal appetency; he has no will: the madman wills, but his reason being disturbed, his actions are not suitable to the usual relations of society."* Fatuity, instead of being an erroneous association of ideas, consists in a want of them, and a total deficiency of intellectual power. The further subdivision of the species into classes, according to the peculiar hallucination under which the mind labours, is useless, and leads to no variety of treatment.

There are some states of the mind which, though they resemble insanity, cannot be properly so called; these are, extreme absence, and abstraction of thought; great peculiarity of actions, or opinions; ungovernable impetuosity of temper, and unreasonable fears and timidity. "Partial affections of the brain may exist," says Dr. Ferriar, "which render the patient liable to imaginary impressions, either of sight or sound, without disordering his judgment or memory: from this peculiar condition of the sensorium, I conceive the best-supported stories of apparitions may be completely accounted for."*

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* See an Essay on Madness, by Dr. John Johnstone.

Sir Matthew Hale says, "There is a partial insanity and a total insanity; the former is either in respect to things quoad hoc vel illud insanire. Some persons that have a competent use of reason in respect to some subjects, are yet under a particular dementia in respect to some particular discourses, subjects, or applications, or else it is partial in respect of degrees. And this is the condition of very many, especially melancholy persons, who, for the most part, discover their defect in excessive fears and griefs, and yet are not wholly destitute of the use of reason; and this partial insanity seems not to excuse them in the committing of any offence, in its matter capital; for, doubtless, most persons that are felons of themselves and others, are under a degree of partial insanity when they commit these offences. *It is very difficult to define the invisible line that divides perfect and partial insanity*, but it must rest upon circumstances duly to be weighed and considered, both by the judge and jury, lest on the one side there be a kind of inhumanity towards the defects of human nature, or, on the other side, too great an indulgence given to great crimes."

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* Theory of Apparitions.

Lord Coke says, " Non compos mentis is of four sorts: first, idiota, which from his nativity, by a perpetual infirmity, is non compos mentis: secondly, he that by sickness, grief, or other accident, wholly loses his memory and understanding: thirdly, a lunatic, that hath sometimes his understanding, and sometimes not; aliquando gaudet lucis intervallis; and, therefore, he is called non compos mentis, so long as he hath not understanding."

" Insanity* is to be considered as it annuls a man's dominion over property: as it involves his contracts and other acts, which otherwise would be binding; and as it takes away his responsibility for crimes."

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* Erskine's Speech for Hadfield.

"In cases of atrocity, the relation between the disease and the act should be apparent. When the connexion is doubtful, the judgment should certainly be most indulgent, from the great difficulty of diving into the secret sources of a disordered mind; but still, I think, as a doctrine of law, the delusion and the act should be connected."

"I cannot allow the protection of insanity to a man, who only exhibits violent passions, and malignant resentments, acting upon real circumstances, who is impelled to evil from no morbid delusions, but who proceeds upon the ordinary perceptions of the mind: I cannot consider such a man as falling within the protection which the law has given, and is bound to give, to those whom it has pleased God, for mysterious causes, to visit with this most afflicting calamity."

"The attack," says Mr. Haslam, "is almost imperceptible; some months usually elapse before it becomes the subject of particular notice, and fond relatives are frequently deceived by the hope, that it is only an abatement of excessive vivacity conducing to a prudent reserve, and steadiness of character.

A degree of apparent thoughtfulness and inactivity precedes, together with a diminution of the ordinary curiosity concerning that which is passing before them; and they, therefore, neglect those objects and pursuits which formerly proved sources of delight and instruction. The sensibility appears to be considerably blunted; they do not bear the same affection towards their parents and relations; they become unfeeling to kindness, and careless of reproof. If they read a book, they are unable to give any account of its contents: sometimes, with steadfast eyes, they will dwell for an hour on one page, and then turn over a number in a few minutes. It is very difficult to persuade them to write, which most readily developes their state of mind."* There are, however, many instances of decided insanity, where the patient can not only write and read, but converse and argue closely and accurately on every subject, except that on which he is insane. To constitute insanity it is not necessary to exhibit the ferocity of a wild beast, nor perform the antics of a buffoon. Every body knows when a man is stark-mad: it is my object to describe a man in that state of mental delusion, when a common observer, or even a person accustomed to insane persons, can with difficulty discover that he is not of sound mind. Learned and respectable physicians have themselves been deceived; and, from being unacquainted with the peculiar hallucination of the patient, have pronounced him sane, when it was well known to those acquainted with the subject of his insanity, that he was a proper object for the restraint of a mad-house.

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* This is the commencement of madness; and for the farther discussion of its gradual advance to decided mania, I refer the reader to page 66 of Mr. Haslam's excellent book on Madness.

Even the acuteness of Lord Erskine was insufficient (being unacquainted with his peculiar hallucination) to detect the insanity of a lunatic who fancied himself to be the Christ; and he was indebted for the discovery, to the presence of Dr. Sims.*

There is a madness which shows itself in words, and another in actions. A lunatic may be coherent in conversation, but insane in conduct: he may be rational when under the restraint of a mad-house; but when released, and at liberty to act according to the impulse of his hallucination, will show, by his conduct, that he is really insane.

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* See Erskine's Speeches, vol. iv.

Insanity may generally be discovered by a wildness in the eyes, very high or very low spirits, extravagant or inconsistent conversation or action: the eyes are sometimes fixed, for a long time, on one object, and often on vacuity. These first symptoms usually pass unnoticed by inexperienced observers; and it is frequently difficult to convince them that the patient is insane, unless his conversation is absolutely incoherent, or his conduct dangerous. The body is generally costive; and in the night, which is passed with a feverish restlessness, conversation is often held with some supposed companion, with whom the insane person generally quarrels. These symptoms of deranged mind gradually increase, and are followed by decided mania. The debility of mind which is left, after the subsidence of a violent fever, appears rather to resemble idiocy than madness, and is generally removed, as the strength of the patient returns. It is very different from delirium, and succeeds it.

Insanity may arise from various causes, as blows or injuries inflicted on the head,* ossification of the membranes investing the brain occasioning irritation, excessive indulgence of the passions of lust, anger, and revenge; intemperance; repelled discharges; fanaticism; intense study; mortified pride, and disappointed ambition. Grief and despair, arising from supposed irretrievable misfortunes, frequently occasion this calamity.†

Where there is a predisposition to it; opiates and spirituous liquors frequently act as the exciting causes. Its approaches are not always slow, but the unhappy victim is sometimes seized almost instantaneously.

I believe a frequent cause of madness is suffering the mind to dwell too long on one particular train of thought, whether the subject be real or imaginary. The ideal lucubrations, the dangerous and unprofitable musings with which many, particularly young persons, allow their minds to be amused, and stray in the regions of fancy, called castle-building, or day-dreaming, I conceive weakens the mind, and, abstracting it from real and useful objects, absorbs its energies in fanciful and futile speculations, which often lead to insanity.

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* This was the cause of Hadfield's madness.

† The number of insane persons was greatly increased in France by the horrors and misery induced by the revolution.

Every powerful idea, whether pleasurable or not, too frequently presented to the mind, tends to weaken the judgment and destroy the healthy functions of the brain. That diseased state of this organ, which lays the foundation of mania, strongly predisposes to anger, but this passion seldom terminates in permanent insanity, unless there be a strong predisposition to the complaint.*

" It may readily be supposed, that a peculiar structure of the brain disposes to madness; but what that peculiar structure is, has never been demonstrated; it may also be readily presumed, that a peculiar structure of the brain may be generated, as well as of feature and limb."*—"Of all the hereditary diseases, madness is supposed to be the most constant and persevering; for, even if one generation escape, the taint is presumed to cling to the succeeding branches, till, either by admixture with a purer stock, or by education or management, it is neutralized or drained away."†

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* See Dr. Crichton on Mental Derangement.

The doctrine of the contagious nature of insanity has not been without advocates, though it cannot be well supported. As creatures of imitation we acquire the habits and peculiarities of those with whom we associate; that madness may be thus acquired is well known, and beautifully illustrated by the Roman poets in the story of the women of Argolis, who became affected by the malady of the daughters of Prœtus;—the insane propensity of the Milesian women to destroy themselves, arose to so great an extent, that it could be checked only by a decree which might be supposed to operate most powerfully on the finer feelings of a woman.

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[*] Dr. J. Johnstone on Madness.

[†] Ibid.

An insanity or incapacity of mind, which may be the subject of legal investigation, is occasionally induced by bodily diseases. Severe and long-continued epilepsy will so far weaken the mind, as to render a person incapable of right reasoning, and consequently not responsible for his actions. This effect may continue some hours, or even days, after a severe epileptic attack.

It is a false notion, that madmen cannot reason; they often reason with accuracy on many subjects, and carry into execution plans, which require subtlety and long-continued dissimulation to mature:* nay, there are instances of their having composed regular and elegant poetry on the subject of their own infirmity;* but some are in a miserable state of most abject brutality.

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* A lunatic having received, or fancied he had received, an injury from his keeper, at the Lunatic Asylum at Manchester, threatened to be revenged, for which he was punished by confinement: he was afterwards a patient in Bethlem Hospital, and gave Mr. Haslam an account of the transaction, of which the following is an abbreviation: "Not liking this situation, I was induced to play the hypocrite: I pretended extreme sorrow for having threatened him, and, by an affectation of repentance, induced him to release me. For several days I paid him great attention, and lent him every assistance: he seemed much pleased with the flattery, and became very friendly in his behaviour towards me. Go-

Our mild and beneficent laws deem an insane person not accountable for his actions; but it is difficult to determine what is, and what is not, to be considered insanity—

> "Such thin partitions do the bounds divide."

We never so much resemble madmen, as when under the dominion of ungovernable anger; but crimes committed when the mind is ac-

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ing one day into the kitchen, where his wife was busied, I saw a knife (this was too great a temptation to be resisted); I concealed it, and carried it about me. For some time afterwards the same friendly intercourse was maintained between us; but as he was one day unlocking his garden door, I seized the opportunity, and plunged this knife, up to the hilt, in his back."—*Haslam on Insanity.*

* See "Account of the Retreat near York," by Samuel Tuke, who gives a specimen of poetry, addressed to Melancholy, by a patient, who, "at the time of its composition, laboured under a considerable degree of active mania:" also the Journal of a Suicide in Dr. Crichton's work on Mental Derangement, in which publication many similar cases are recorded.

tuated by this passion, subject the perpetrator to the punishment of the law.

It is evidently the opinion of Lord Erskine, that Earl Ferrers (though a strong plea of lunacy was urged in his favour) was instigated to the murder by malignant resentments, and merited the punishment he received.

Even the confessions of apparently insane persons should be received with caution.—One Oliver Lamb was executed at Berwick-upon-Tweed, in 1722, for the murder of his mistress. He had for some time shewn strong symptoms of disordered imagination, and declared the devil prompted him to murder his mistress: she was soon afterwards found murdered in her bed, and a considerable sum of money taken away. Being informed of the circumstance, he immediately declared himself the murderer, and was executed, although (no part of the property having been found upon him,) many persons disbelieved his confession, and were persuaded he was insane. Shortly afterwards his innocence became known; a man convicted of other crimes made a voluntary confession, that he alone was the murderer of Mrs. Fergusson.

In my own mind I have no doubt that Bellingham, who shot Mr. Percival, was mad; and his own account of the transaction warrants that conclusion. I am also of the same opinion respecting Nicholson, who murdered Mr. and Mrs. Bonar at Chiselhurst; for, it appeared that he was neither instigated by the spirit of revenge, nor the hope of plunder. Several similar atrocities which have lately been committed in this country, are of the same complexion: where no insanity is proved, and there has been none previously existing—where the delinquent has acted from "facts and existing circumstances," I am far from wishing to demand for him the protection which the law gives to insane persons; its improper extension would become a cloak for crimes, which would ultimately tend to the injury of the community, and the subversion of social order; but where there are strong reasons to believe the criminal to be insane, although it may be difficult to prove it, the laws of humanity are less violated, and the ends of justice as completely answered, by consigning him to perpetual imprisonment, as by taking away his life. The example is as impressive on the public mind, and sanguinary laws are framed not so much to avenge crimes as to prevent their commission.*

There is an illusion as to particular things to which some, and especially men of genius are subject, which leads them to indulge eccentric whimsies and extravagant fancies, whilst on every other subject their perception is clear, and their conclusions correct; instances of this kind abound in every treatise on insanity, and may be traced from the earliest period of history. Pythagoras believed that he had lived in prior ages, and inhabited different bodies, and that in the shape of Euphorbus he had assisted at the siege of Troy. Tasso fancied himself to be visited by a familiar spirit, with whom he conversed aloud.† The hero of the celebrated romance of Cervantes, exhibits a well drawn picture of this species of insanity.

Partial insanity, which escapes the observation of the patient's family, is sometimes obvious to strangers. The great difficulty which often exists of discovering this species of the disorder, has led to considerable inconsistency of medical opinion. If patients are aware that they are being questioned for the purpose of proving their insanity, they artfully avoid uttering an absurdity, and have imposed upon the most wary; nay, they sometimes even acknowledge themselves to have been deceived as to the existence of their insanity; but the hallucination soon returns.* It is a common opinion, that maniacs do not suffer from cold; and the manner in which they have been kept in Bethlem, with unglazed windows at all seasons of the year, may have given rise to the opinion: it appears, however, to be erroneous, as they are particularly subject to mortification of the feet, and are always to be found as near the fire as they can get, during the winter season. They sometimes abstain from food for several days, without suffering any apparent injury, and frequently will not eat when any person is present, though, if the food be left, they often devour it when alone. Some eat voraciously.

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* See Appendix, note G.

† Hoole's Life of Tasso.

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* Mr. Matthews, a patient lately confined in Bethlem Hospital, though rational on every other subject, "insists that, in some apartment near London Wall, there is a gang of villains, profoundly skilled in pneumatic chemistry, who work upon him by means of an air-loom; an account of which he is persuaded is to be found in Chambers's Dictionary. The assailing gang consists of seven persons—four men and three women." For a further account of this curious case, see Haslam's Illustrations of Madness.

Excessive enthusiasm sometimes partakes of the character of insanity: of this I shall say nothing, as I know not where to draw the line; and if the doctrine is stretched to its utmost limits, who shall escape the imputation of madness on some subject or other? Numberless instances prove how short the distance is between genius and insanity. "It is a doctrine confirmed by much experience, that every man is so strangely particular in some point or other, that it may be considered as an insanity *quoad hoc*, it being like other insanities invulnerable to all argument. If the circle in which this absurdity revolves is so very small as to touch nobody, a man is only what is then called *singular* in that respect; but if its orbit is extended so as to run foul of other people, he is then called a madman and is confined."*

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* Armata, part ii.

Such is the difficulty of distinguishing between peculiarity of conduct and insanity, that medical men, on whom devolves by law, the duty of consigning a lunatic to confinement, or attesting the existence of his disease, are often perplexed how to act with propriety. Do we not sometimes see a wretch disinherit his own children, who have committed no fault, and bestow his wealth upon a stranger? another who prefers poverty and rags, and communion with vagabonds to the social intercourse and proffered kindness of his friends and relations? Yet who shall pronounce them insane? That they are so, there can be no doubt, and their disease is perhaps of the most unfortunate character, for all their other actions being consistent with sound reason, it is difficult to convince a Jury of their insanity and to divest them of the power of heaping ruin upon their families and disgrace upon themselves.

That kind of insanity which has been properly called *intermittent*, is different from *partial:* for a considerable period, the patient is perfectly rational on every subject—the disease often recurs two or three times in a year, and lasts several weeks, the subject of the hallucination always being the same.

The prevailing complexion of maniacs is swarthy, with dark or black hair. Out of two hundred and sixty-five, two hundred and five were of this complexion; the remaining sixty were of a fair skin, and light brown or red-haired.*

Maniacs generally sleep but little, and talk much during the night; there is great deficiency of irritability in the stomach and bowels, and large doses of medicine are required to move them.†

A lunatic, though not punishable for criminal offences, is nevertheless compellable in a civil action to give satisfaction for damages. Though he labours under many legal disabilities, he is allowed to act in some things by his committee, and even to sue for a divorce from his wife, by reason of adultery.*

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* See Haslam on Insanity.

† Mr. Haslam thinks this notion erroneous; I have, however, seen six grains of tartarised antimony, and large doses of the drastic cathartic medicines taken, without producing any effect; a pint of the strongest infusion of senna has sometimes given only one or two evacuations.

Melancholia is characterized by inactivity of body and mind, inability to attend to the ordinary occupations of life, silence, and a countenance full of anxiety and despair. A person may have perfect possession of reason on every subject, whilst labouring under a considerable degree of melancholy, and suffering from extreme dejection of spirits, for which he can assign no cause.

A melancholic person may make a will, if it can be proved that he has a "disposing memory, so as to be able to make a disposition of his estate with understanding and reason;" but idiots or insane persons are incapable of devising property.

The range of the human understanding being on a large and comprehensive scale, it is proper to determine what latitude is given to the term idiot. The law defines an "idiot or natural fool to be one who has so little sense, as to be unable to number to twenty, or to tell his age, or to answer any common questions, by which means it may plainly appear that he has not reason to discern what is to his advantage or disadvantage."[*] "But a man is not an idiot, who has any glimmering of reason, so that he can tell his age, know his parents, or such-like common matters."[†]

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* See Courier Newspaper, Jan. 26, 1814, Consistory Court, Doctors' Commons, in the case of Parnel (by his committee) against Parnel.

Idiotism is most frequently congenital, but sometimes accidental, and may arise from diseased organization of the brain, intense study, intemperance, excessive evacuations, the action of depressing passions, epilepsy, fevers, and other causes occasioning debility. Mania often degenerates into fatuity. The disease arising from some of the above-mentioned causes is sometimes only temporary and curable; but congenital idiotism is beyond the power of medicine, and that consequent to epilepsy is very seldom cured.

A species of fatuity is often the consequence of paralytic affections; and mania occasionally arises from the same cause. Idiots have a defective memory, an inarticulate speech, a peculiar expression of countenance, and a drivelling of saliva from the mouth; which latter symptom arises, probably, not from any inordinate secretion of that fluid, but from carelessness in not swallowing it.

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[*] Burn's Eccles. Law.

[†] Fitzh. N. Brev. 233.

When cases of insanity come before courts of justice, the medical practitioner is generally asked:

1. Whether there is a probable chance of recovery?

2. Whether there has been any lucid interval, and of what duration?

3. Whether the symptoms are sufficiently mild, to suffer the patient, with propriety, to retain his liberty and possession of his property?

4. Whether, in cases of convalescence, the cure is likely to be permanent?

To determine the probability of recovery, we must take into consideration the nature of the malady; whether it be melancholy, fatuity, or furious madness; its cause and duration, the frequency of its attack, the sex and age of the patient.

" Patients who are in a furious state, recover in a larger proportion, than those who are depressed and melancholy."* The alternation of the disease from mania to melancholy, and vice versâ, is considered unfavourable.

Hereditary madness, and that occasioned by fanaticism, is not so soon nor so frequently cured, as that diseased state of the mind which is induced by real misfortunes and difficulties in life, or by debilitating causes.

The protracted duration and frequent recurrence of the disease, diminish the probability of cure; when it has continued upwards of a year, patients at public asylums are put upon the incurable establishment.

Where there is in women an hereditary disposition to madness, it is frequently called into action immediately after parturition. In these cases, the prognosis is always favourable. "In our climate, women are more frequently affected with insanity than men: from whatever cause it may arise, it is considered very unfavourable to recovery, if they should be worse at the period of menstruation, or have their catámenia in very small or immoderate quantities."*

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* "Of one hundred violent cases, sixty-two were discharged well: of the same number of melancholic cases, only twenty-seven."—Haslam.

Females recover in larger proportion than males, and their disease is often called into action by peculiarities of their constitution: but when it arises, in either sex, from exciting causes whether moral or physical, unconnected with the peculiarities of sex, the proportion of cures will, probably, be found to be nearly the same.

"Insane persons recover in proportion to their youth;"† but it was the opinion of the late Dr. Willis, that age was of no signification, unless the patient had been afflicted before with the same malady. Children, and very old persons, are seldom mad; the disease most commonly occurs between the ages of thirty and forty, at which period of life we are most exposed to its exciting causes.

A medical man is always asked, whether

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* Haslam.

† See a table of ages, and proportionate number of cures, in Haslam's excellent Observations on Madness, page 249.

or not a patient has lucid intervals. By this term is to be understood, not a *remission* of the complaint, but a temporary and total cessation of it, and complete restoration to the perfect enjoyment of reason on every subject. This is a question not very easy to answer, and requires attentive observation and long and repeated examination to determine, by a person acquainted with the subject of the patient's insanity. The occurrence of these intervals of reason is deemed favourable, particularly when they supervene to a night of sound sleep.

It is often difficult to pronounce a convalescent perfectly restored to reason, and fit to be returned to society. It is necessary that he should be able to converse on all subjects rationally; to bear the presence or recital of the exciting causes of his disease, and receive without emotion, the visits of his family and friends. The disease, however, sometimes recurs with all its violence, soon after returning home; and some maniacs, though furious in their own houses, become quiet and tractable when removed.

It is not always necessary to restrain insane persons, or to deprive them of the management of their property. Some who are insane on one subject only, are peaceable, and competent to the proper conduct of their affairs; and instances are not wanting of their having been intrusted in the exercise of their profession: but this state seldom lasts long, and watchful attention to their actions is always necessary. When the disease is so far advanced, as to be properly called madness, control becomes necessary, and the maniac should be removed from his own house, and those objects to which he has been accustomed.

Confinement, strictly speaking, is never proper, except the conduct of the maniac is furious, or threatens danger to himself or others; though he should not be allowed to go abroad without being accompanied by a proper attendant. The greater number of insane people fall into an atrophy or decay, towards the decline of life; many die of pulmonary consumption, but hydrothorax seems to be the disease to which they are most subject.* They are seldom the victims of asthma, gout, rheumatism, malignant epidemics, or sudden death,—they appear, indeed, to be in a remarkable manner exempt from most of those diseases which flesh is heir to. Idiots seldom attain old age, but the lives of insane and melancholic persons are often protracted to a considerable period.[*] Epilepsy sometimes supervenes to insanity, which greatly diminishes the hope of cure.[†]

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* Crichton on Mental Derangement.

Dissection has thrown but little light on the cause of insanity; the brain, which always has been supposed to be the seat of this disorder, has seldom evinced those morbid appearances which we should have deemed requisite for the production of such fatal effects. The skull has sometimes been found thicker, sometimes thinner than usual. The membranes of the brain are occasionally thickened and inflamed, and the vessels distended with blood.

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[*] Qui morbo isto afficiuntur, vitam diutissime haud raro protrahunt. Mead's Medica Sacra, p. 69.

[‡] Sæpe etiam evenit, ut post longum tempus dementiœ superveniat epilepsia. Sunt enim affines hi morbi, neque in hoc casu spes ulla salutis affulget, ut usu compertum habemus. Ibid.

Effusion of coagulable lymph on the surface of the brain, or extravasation of serum in the ventricles, is generally observed. An appearance of air in the vessels of the pia mater has been noticed in several of the dissections recorded by Mr. Haslam. The medullary substance of the brain, when cut into, seems to contain more blood than usual; a gritty matter consisting of phosphate of lime, has been found in the pineal gland. The brain is sometimes softer, sometimes harder than usual, possessing a certain degree of firmness and elasticity. *Bonetus*, in his *Sepulchret. Anatom.* has asserted, that the brain of maniacs is so dry and friable that it may almost be rubbed into a powder—this observation has been copied by other writers, but experience has shewn the reverse to be true. The most general appearance which has been observed is a considerable determination of blood to the head, and serous effusion.

In the cure of mania, the remedies should be adapted to the constitution of the patient, the state of the body, and the symptoms and character of the disease. As in all other diseases, the cause should be ascertained, and the treatment suited to it.

In plethoric habits, bleeding immediately from the head has been employed with great advantage, both in maniacal and melancholic cases.

Purging is very beneficial, and will sometimes, in early stages, divert slight attacks of the disease: it in all cases forms an essential part of the plan of cure. The sympathy which exists between the liver and the brain has been long well known, hence the term melancholia and hypochondriasis; but the connection of insanity with diseases of the Hepatic organs has, perhaps, not been sufficiently attended to by modern practitioners.

Emetics in the hands of some practitioners have been very serviceable; but the general opinion of medical men is not in their favour. The result of their employment in Bethlem and St. Luke's Hospitals, and in several private establishments, does not justify their frequent or indiscriminate use; they, however, often produce a temporary calm.

Camphor has been employed with advantage in many cases. Dr. Ferriar and Dr. Cox have spoken highly of the benefit they have derived from the employment of large doses of digitalis. Hyoscyamus, hemlock, and other narcotics, have been recommended, but I cannot find much testimony in their favour. Opium has not been productive of permanent benefit. Blisters to the head and neck are occasionally serviceable, but are sometimes supposed to be injurious, from the irritation they occasion; their application to the inside of the legs has often mitigated the violence of the disorder.* Warm bathing is likely to be of great service in this disease; but the cold bath has not afforded any decisive advantage, and is, in some cases, supposed to have caused paralytic affections, which in a short time have supervened on its administration; but I have frequently seen benefit result from washing the head with æther or cold water. The rotatory swing has been suggested by Dr. Cox, as a means of curing maniacal affections, and (notwithstanding the ridicule with which some writers have treated the proposal) has in many cases contributed in a great degree to allay the violence of furious paroxysms.

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* Haslam on Madness.

When debility is the cause of the mental disease, or has been induced by the remedies which have been employed for its cure, bark, mineral acids, and other means adapted to invigorate the system are proper and often beneficial.

Respecting the curative means to be employed in this most dreadful of all human calamities, but little has hitherto been attempted. It is to be lamented, that, in general, madhouses have been considered as prisons (some of them, unhappily, worse than prisons) for the safe custody of patients, rather than as hospitals for the treatment of their maniacal disorder. It is the opinion of some, that more is to be expected from the judicious management of lunatics, than from medicine. But as the diseased state of the mind often proceeds from corporal irritation, we may, I think, expect much from the judicious and *well-timed* administration of medicine, aided by exercise, employment, suitable occupation, and amusement of the mind, removing at the same time all causes of mental and corporal excitement.

The moral treatment of the insane, the "medicine of the mind," is of great importance, and the idle and unemployed state in which they are generally forced to eke out their existence, must materially tend to protract the disease. They are often, however, incapable of bodily or mental exertion, but, during the intervals of tranquility and reason, every innocent recreation and employment should be introduced suitable to their former habits, their ability and inclination: the importance of this has been acknowledged, and it has formed part of the plan of cure, of late years acted upon in some of our most respectable private asylums. At an establishment in Ireland, many of the patients have been taught to spin, with profit to the Institution and benefit to their health.

In cases of dangerous and furious mania, close confinement, and sometimes coercion, by means proportioned to the violence of the complaint is proper and necessary, but in no others.

Of corporal chastisement I shall say nothing, as I trust the whip is banished from every madhouse in the kingdom. A keeper should on no account be allowed to strike an insane person, or to keep him in restraint longer than is absolutely necessary. There are other more mild and effectual means of punishment, which may be employed when the patient has reason enough to be sensible of their application: when he has not, all chastisment is wanton and unnecessary cruelty, and is better calculated to destroy reason than to restore it.

It is to be hoped, that, in consequence of the late judicial investigation into the state of madhouses in England, their unfortunate tenants will henceforth be treated with greater humanity, and though unhappily deprived of reason, the noblest attribute of man, by the fiat of their Maker, not be degraded below the state of beasts, by the inhuman barbarity of their fellow-creatures.

Fatuity, as I have before mentioned, is seldom curable; when it arises from debilitating causes, exercise, sea-bathing, bark, change of air, and nutritious aliment, are the remedies to be employed for its removal.

PRETENDED DISEASES.

Diseases are frequently feigned for the purpose of exciting commiseration, or escaping punishment or military duty.

Insanity was feigned by David, Ulysses, and Lucius Brutus, and has been by others in later times. It may, however, generally be soon detected, as it is difficult, for any length of time, to imitate the manner of a lunatic, and to bear the privation of sleep. An insane person generally sleeps little, and talks much during the night; but a pretender, if he thinks he is not watched, will sleep, and only act his part when he believes his conduct to be observed. There is, moreover, a peculiarity of manner and countenance, belonging to an insane person, which is well known, and not easily counterfeited: it is more common that madmen pretend to be well, than that sane persons feign madness.

Epilepsy is frequently pretended by beggars, to gain admission into, and enjoy the comforts of hospitals, or to excite the commiseration of bystanders. This disease has been sometimes so well imitated, as to deceive medical men; it may, however, be detected by observing the pupils of the eyes, which are dilated during a fit of real epilepsy, and do not contract on the application of light; nor is the patient affected by rubbing volatile alkali, or other ordinary stimulants, on the nose. The tongue is generally bitten, and the mouth bloody during the attack: the blood may be sucked from the gums; and the mouth made to froth by chewing soap:* but few pretenders will be hardy enough to bite their tongue severely.

Hysteria being attended with such a variety of symptoms, and appearing in such various shapes, is easily imitated. Dr. Cullen is said to have been deceived by a man, who, pretending to have this disease, was retained as long as suited his convenience in the Edinburgh Infirmary, and afterwards triumphantly acknowledged the deceit. When we have sufficient reason to suppose these diseases to be imitated, keeping the person on low diet, separate from the society of the hospital, and threatening, on the appearance of the fit, the application of the actual cautery, are the most likely means to discover the fraud. Some pretend that they have no pulsation at the wrist, which deception is occasioned by tying tight ligatures round the arms; others, that they can suspend the action of the heart: that this may be done by some persons, is very probable. Dr. Cleghorn, of Glasgow, mentions in his Lectures, the case of a person, whom he knew, who could feign death, and had so completely the power of suspending, or, at least, moderating the action of the heart, that its pulsation could not be felt: this man, some years afterwards, died suddenly.*

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* See the evidence before a committee of the House of Commons, on the subject of Mendicity.

Ulcers of the legs, of an incurable nature, are often feigned by beggars, and by soldiers, to procure their discharge. These are made by the application of a common blister, or one made of the leaves of the ranunculus, and the wounds kept open and deep, by applying copperas: if this cannot be easily procured, they bind a piece of copper coin on the sore. Military surgeons should be cautious how they give certificates to soldiers wishing to obtain their discharge from a regiment, on account of incapacity to serve from this cause, and should, for a time, shut them up in a ward in the hospital, where they cannot procure copper coin, or buttons, or other means of keeping open the sore: if the wounds have been kept open by such methods, they will very soon heal under proper treatment.

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* There are on record instances, where the pulse ceased in either radial artery as long as the person rested on a full inspiration; and others, where the pulse in those arteries was lost for more than a fortnight.—PARRY's Elements of Physiology.

Long fasting, or the power of refraining altogether from food for years, has been frequently the subject of imposition. The recent case of Anne Moore, of Tutbury, is a remarkable instance.*

Vomiting of urine, and making bloody urine, have sometimes been pretended: this last is practised in India, and its appearance caused by eating the Indian fig *(cactus opun-*

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* See the trial of an impostor, for a similar offence, in the State Trials, vol. v. p. 482.

tia), or the fruit of the prickly pear, which renders the urine of a bloody colour.

Dropsy is frequently pretended by women with child, either from ignorance of their real situation, or to conceal for a time their shame, or to procure the convenience afforded by an hospital. When pregnant women are unknowingly admitted, their case may be discovered by the appearance of the breasts, or by examination, which, when there is any doubt, should be insisted upon. Pregnancy is frequently pleaded, for the purpose of delaying the execution of the law.

Blindness is sometimes counterfeited: if the pupil does not contract, there is no doubt that the disease exists; but if it does, we may suspect its reality, though, in some cases of amaurosis, the pupils are sensible to the stimulus of light. By reflecting the rays of the sun upon the eye, by means of a mirror, the deception will be immediately discovered.

Deafness and dumbness, fever, lameness, and contraction of the limbs, and many other diseases, have been feigned, which may generally be detected by the absence of their leading characteristics. Some complaints, particularly those of the spasmodic class, vary in different people so much, as to induce a suspicion of their being pretended. Lord Monboddo, in his Ancient Metaphysics, mentions an extraordinary case, of what he calls jumping ague, in which the person affected, would jump on chairs and tables, and run with great velocity, during sleep.

Many well authenticated histories of this disease are to be found in Sir John Sinclair's statistical account of Scotland: in some parts of Forfarshire, it is said to be very common and even hereditary. When the propensity to run comes on it cannot be resisted; and the patients fly with astonishing velocity to some place on which they have fixed their minds, or leap from one part of the house to another with the agility of a cat. Similar spasmodic diseases, occasioned by religious enthusiasm or other stimuli operating powerfully on the mind, and propagated by sympathy, have been epidemic, but are more common in northern than southern climates.*

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* Haygarth on the Imagination.

Gravel and stone are sometimes pretended to be voided: this imposition may be detected by a chemical analysis of the calculus.

The skin has been stained to imitate jaundice; but the clearness of the eyes (which are always yellow in that disease,) and the colour of the evacuations, will easily detect the imposture.

Hernia is said to have been feigned, by blowing air into the cellular membrane; and the pretended vomiting of pins, frogs, beetles, and other animals, has sometimes deceived the credulous and unwary.

IMPUTED DISEASES.

Diseases are sometimes imputed to procure divorce or separation, to obtain possession of the property of another, or to prevent marriage. These diseases are impotence, lues venerea, fits, insanity, or imbecility of mind, and dotage.

Women have been accused, by an enemy, of having been pregnant, for the purpose of destroying their characters, and preventing marriage. The just foundation of these charges may generally be ascertained by examination; and for the means of discovery, as far as it can be effected, I refer to the heads under which these subjects have been separately treated. It is shocking to think, and has probably been little suspected, to what an extent imputed insanity may have been carried, either where it has not existed, or only in so slight a degree, as not to warrant confinement; or how much it has been exaggerated, and its cure retarded, by the inhumanity of relatives.

" I knew an instance," says Mr. Bakewell, " of a person of very respectable family, who became insane soon after giving birth to a son. Such cases are generally supposed easy of recovery, from particular circumstances; that it is merely a temporary irritation. She was packed up into a back garret, where she was coarsely fed and coarsely clothed, while her husband enjoyed every luxury that money could purchase, in the house below, till that son became of age, and had her released. I know another family, who have kept a brother for seven years in confinement, without any means of recovery, FOR THE SAKE, AS I FULLY BELIEVE, OF HIS PROPERTY, though they are all in opulent circumstances.

"I have known a son very evidently taking measures to prevent the recovery of his father; and I have known several instances of people of opulence taking measures to prevent the recovery of their own brothers.

"I have seen evident proofs of vexation and disappointment in a wife, on the unexpected recovery of her husband; the same in a husband, on the unexpected recovery of his wife; and in a mother, on the unexpected recovery of a son. I have now in the house, a woman who has been confined in a dark garret, without the comforts of a fire, for the best part of twenty years: her husband confessed to me that he had not seen her for many years. The servant told me that nobody saw her but herself; and she only to take her food, and take away the necessaries. The woman was perfectly inoffensive. He himself was trading at the rate of a thousand pounds a week, by his own confession. Upon his bankruptcy he was obliged to provide some means of treatment for her, and he desired me to take her. I have found her very susceptible of good treatment: she seems to take a delight in looking at my children, and the comforts of a good fire; and has some little exercise, occasionally walking out in the open air."*

Such infamous abuses cry loudly for legislative interference, and we may hope, will, for the future, be prevented.

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* See Examination before the Committee of the House of Commons, appointed for the better regulation of madhouses in England.

PREGNANCY.

Pregnancy is sometimes the subject of juridical inquiry: it may either be *pretended* or concealed.

Pregnancy has been pretended from a variety of motives: first to gratify the wishes of a husband; secondly, with a view of disappointing the legal succession, or keeping possession of property for some months, till its existence is disproved; thirdly, to extort money; fourthly, to delay the execution of punishment. The existence of pregnancy may be ascertained by particular indications, as morning or evening sickness, cessation of the menses, enlargement of the womb and breasts, the nipple surrounded with a dark coloured areola full of sebaceous follicles; and, in the fifth month, or after the eighteenth week, by the motion of the child, which is frequently strong, and may be felt externally by the hand, but this motion is not always perceived; it may also be discovered by the touch; in advanced pregnancy the os uteri will be easily felt, and will be found closed, and to have assumed an annular figure. The enlargement of the abdomen, or even of the womb, are not to be depended upon as certain signs: the first may be occasioned by dropsy, tympanitis, scirrhus of the mesentery, or morbid enlargement of the abdominal viscera. The increased size of the womb may be occasioned by hydatids, or a collection of water in its cavity, or disease of its substance. Dropsy of the ovaria often greatly resembles pregnancy.

Anasarca, or dropsy of the belly, may be distinguished from pregnancy by fluctuation, but not always, as the water may be encysted. When utero-gestation really exists, it may generally be ascertained; but every practitioner knows that, under some circumstances, and particularly where there is much disease, it is impossible to form an accurate opinion: hence, pregnant women have been tapped for the dropsy, and diseased women, not pregnant, have prepared clothes for their expected infant. Milk in the breasts of a woman, who has not lately suckled a child, is, with other concomitant symptoms, a pretty certain indication; but the Enthymem of Aristotle, *Lac habet ergo* *peperit*, is false, as Hebenstreit says he has known a woman, who could bring milk into her breasts by suction, or light and continued rubbing; and occasionally virgins and new-born infants of either sex, nay, even men as well as the adult males of other mammalia, have been known to furnish milk.*

Cessation of the menses is not a proof of pregnancy, nor is their flow a certain evidence that a woman has not conceived; for there are many examples of the continuance of this evacuation for some months after conception. I know a woman who was regular for eight months during a pregnancy. "I knew one," says Dr. Heberden, "who never ceased to have regular returns of the menstrua, during four pregnancies, quite to the time of her delivery."†

Pregnancy is often concealed by unmarried women to avoid disgrace, and by those whose husbands have been long absent.

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* Blumenbach's Institutions of Physiology, Sect. 42—see Appendix, note H.

† Commentaries on the history and cure of Diseases. Chap. 43.

PRETENDED DELIVERY

Has sometimes been practised, to impose unlawful heirs on families, to displace the lawful ones, or to gratify the desires of a husband who wishes for children; it is to be discovered by the means mentioned under the head of Abortion, and by the evidence of those who pretend to have been present at the birth. An extraordinary circumstance of this kind happened to a surgeon of this town not long since. Being called to a pretended labour, a dead child was presented to him, but there was no placenta; he proceeded immediately to examine the woman, and found the os tincæ in its natural state, nearly closed, and the vagina so much contracted, as not to admit the hand. Astonished at this appearance, he went to consult a medical friend; but before any farther steps were taken, it was discovered that he had been imposed upon. The woman, in fact, had never been pregnant, and the dead child was the borrowed offspring of another: she was induced to practise the artifice, to appease the wrath of her husband, who frequently reproached her for her sterility.

RETARDED DELIVERY.

Aristotle and Pliny suppose a woman may go longer than nine months, but that other animals more regularly observe the natural period. Haller is of the same opinion, and refers to cases where women have gone thirteen or fourteen months. Hippocrates says, pregnancy cannot go beyond the tenth month. Modern physicians entertain different opinions on this subject. It is probable, that a woman seldom carries her child in the womb many days longer than nine months, but it is well known that extra-uterine gestation may continue for years.*

Dr. Hamilton says, "Individuals of the same class of quadrupeds it is well known vary in their periods of pregnancy. May we not from analogy, reasonably infer that women sometimes exceed the more ordinary period?

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* Since the publication of the first Edition of this Work, two cases have come under my own eye, and others to my knowledge, which induce me to think that protracted pregnancy does occasionally take place.

In several tolerably well attested cases the birth appears to have been protracted several weeks beyond the common term of delivery. If the character of the woman be unexceptionable, a favourable report may be given for the mother, though the child should not be produced till nearly ten calendar months after the absence or sudden death of the husband."*

It is the opinion of some eminent physicians, that in consequence of pulmonary consumption, or a waste of the body, by which the nutriment of the fœtus is diminished, the birth of a child may be delayed, and that the same effect may be occasioned by grief: but these causes more commonly produce premature labour.

A want of activity in the male semen, when the father is very old or weakened by disease, has been supposed to have the same effect. The old government of France allowed ten months. A decision was given in favour of a widow in that country, who pretended she had been with child one year and three days; but her veracity was by most sensible people greatly doubted. In another case, a child was deemed legitimate, though born of a woman who had been four years separated from her husband, and its generation was attributed to a dream, or the force of imagination.* These instances, however, are too absurd to be spoken of seriously.

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* Outlines of Midwifery, by Alexander Hamilton, M. D. p. 192.

By the laws of most countries children are deemed legitimate, though born at a longer period than nine months after the death or departure of the husband: the law of England does not prescribe any particular time; there is, however, on record, a case, in which a child born forty weeks and nine days after the death of its father, was adjudged to be legitimate; the mother had been turned out of doors, and abused by her father-in-law, and the physicians declared that by ill usage, grief, and want of nutriment, the birth might be postponed:†

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* See Mahon de la Médecine Legale.

† Burn's Justice, article Bastards; also Hargrave's State Trials.

this decision was given, although the woman was of acknowledged bad character. By the law of Scotland, " a child born after the tenth month, is accounted a bastard."*

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* Erskine's Institutes of the Law of Scotland.

ECCLESIASTICAL COURTS.

TO ecclesiastical courts are referred questions relating to marriage. This contract may be dissolved by a variety of causes, respecting some of which, the opinions of medical men are occasionally required: among these is *impotence*, in either sex.

Impotence in males may arise from moral or physical; from external or internal causes; it may be temporary, or permanent and incurable. The external causes are tumors, or other unnatural enlargements of the penis; its deficiency, either from natural or accidental causes; its total absence, or partial destruction, which latter are not unfrequently occasioned by venereal affections. Obliteration of the canal of the urethra (which, instead of opening into the glans penis, opens into the perineum, or at the middle of the penis,) though not strictly speaking, a cause of impotence, occasions sterility. The testicles are sometimes exceedingly small—a case of this kind is mentioned by Dr. Baillie, which arose from a fault in the original formation, and was attended with a total want of the natural propensities.*

The deprivation of both the testicles, or cancerous affection of them, occasions impotency; but one alone, in a sound state, is sufficient for generation. The testicles sometimes remain in the abdomen very late, and, by a sudden and violent exertion are thrust into the scrotum; there are instances of their having continued in the abdomen during life, in which cases Mr. John Hunter thought (and Zacchius and Riolan were of the same opinion,) that sterility would be the consequence; but there is sufficient evidence to prove the contrary; and it is now generally believed that it is accompanied by neither impotence nor sterility. There are instances of persons having more than two testicles: four, or even five, are said to have been seen.* Pope Sixtus the Fifth declared he would divorce all eunuchs; and the parliament of Paris, in 1665, decreed that the matrimonial contract should not be deemed valid, unless two testicles were evident. Eunuchs are generally without passions or energy.

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* Morbid Anatomy, p. 362.

M. Larry, Inspector-general of the French army, says, that many of the troops, on their return from Egypt, were affected with a disease, which he calls atrophy of the testicles; they became soft, and gradually diminished, without pain, or the existence of any venereal symptoms. When they are both so affected, the generative faculty, and the natural sexual desires, entirely cease. In persons affected with elephantiasis, the genitals diminish, and all sexual appetite is lost.† Park-keepers, who have the management of deer, annul the power of generating in bucks, by squeezing the testicles forcibly, and thus destroying their organization and secerning faculty. The Algerines, unwilling to castrate their horses, are said to have recourse to the same practice, to render them incapable of propagation.*

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* "Nous avons vu en France trois frères de la plus grande naissance, dont l'un possidoit trois testicules, l'autre n'en avoit qu'un seul, et le troisième n'en avoit point d'apparens: ce dernier étoit le plus vigoureux des trois."—Vide Voltaire and Bertholin quoted by Mahon.

† See Med. Transact. of the College of Physicians, vol. v. and Dr. Adams on morbid poisons.

The internal causes of impotence are paralysis, affecting the muscles of the penis, affections of the mind,† general debility of the body, either from accidental disease or habitual intoxication or excess. To invalidate marriage, however, it is necessary that the disease should be absolutely incurable. Malformation of the organs seldom admits of a remedy. Another kind of impotence arises from frigidity. " Alterum signum impotentiæ," says Zacchius, " est membri quamvis optimé conformati, flacciditas quædam, et incitabilis mollities." Frigidus is censetur qui licet habet membrum, habet tamen inutile ad copulam quia inerigibile. The canons of the

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* Shaw's Travels, chap. ii.

† See Cullen's Synopsis-Dyspermatismus.

Romish church, and the decretals of the Popes are full on this subject, and many curious trials are on the records of the French parliaments; but none have excited more attention throughout Europe, than the extraordinary case of the young Marquis de Gesvres, and his Lady, at Paris, in the beginning of the last century.

Mr. Hunter was consulted by a person, whose urethra opened into the perineum; being desirous of having children, he recommended him to inject, by means of a syringe, the semen into the vagina, *post coitum*, and during the existence of the orgasmus venereus; which plan was supposed to cause impregnation. A similar experiment was made by Spallanzani, and by Dr. Rossi, on bitches in heat, and they brought forth whelps resembling the dog from which the semen was procured.* When the complaint arises from relaxation, general debility, mental affliction, &c. it is often curable by tonic and stimulating medicines, cold bathing, and nutritious diet; but where it is occasioned by paralysis of the muscles of the penis, the prognosis is not favourable. That some injuries of the brain, or a diseased state of that organ, will occasion loss of virility, is well known; and a case is related by Mr. Hennen of a soldier, so affected in consequence of fracture of the occipital bone, by the fragment of a shell.* The excessive potation of strong coffee, or whatever debilitates the nervous system, is supposed to occasion venereal apathy.† The imagination is sometimes the cause of temporary impotence, with regard to certain females; for some curious instances of which, I refer my readers to Mr. John Hunter on the Venereal Disease, chap. xii.; and Montaigne's Essays, chap. xx. on the Imagination. In the famous case of the Earl of Essex, and Lady Frances Howard, in 1613, the marriage was declared void, because the Earl, on his own confession, was impotent with regard to his Lady, although he had no defect or impediment, and was able to copulate with other women. This decision, however, caused great dissatisfaction in the country, and the bishops and civilians by whom it was made, brought odium and ridicule upon themselves. The defectus voluntatis sed non defectus potentatis, cannot be considered *perpetuum & incurabile.* The marriage contract is not dissolved, *ab initio*, by impotency, but by sentence of separation during the lives of the parties.*

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* Dissertations, vol. ii. p. 250.

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* On the Practice of Military Surgery.

† Murray's Apparatus Medicaminum, vol. i. p. 395.

A certain degree of impotence, occasioned by early and excessive debauchery, and by manustupration, is, I believe, more common than is generally imagined. When it exists, the secret is of course confided only to a medical friend. It is accompanied by an involuntary discharge of semen, which occasions great debility, and difficulty, or impossibility, of exciting the turgescence of the penis. Ab ea enim corruptela, impotentia insanabilis supervenit, et seminis fluxus involuntarius perpetuus, obstipa rigiditas, tabes intra triennium funesta, amissa judicii vis, et omne fèré malorum genus, quod votis velis avertere.†

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* See Appendix I.

† Haller Elem. Physiol. vii. p. 573.

I have seen three cases of this kind; one of them was occasioned by a species of satyrismus, the cause of which I could not discover.

Impotence in women may arise from adhesion of the labia, or closure of the vagina, in consequence of inflammation; it is sometimes contracted from original formation, sometimes from disease: it is occasionally impervious or entirely absent; in the latter case the uterus has been found wanting.* Scirrhous hardness or polypi in the vagina, prolapsus uteri or vaginæ, faults in the menstruation, extensive enlargement of the nymphæ or clitoris, or unnatural density of the hymen, may be causes of impotency. Ambrose Paré mentions the case of a young woman, whose hymen was as strong as parchment, which he was obliged to cut with the scissars, before coition could be effected. The late Dr. Clarke used to relate a similar case in his Lectures; and one is recorded where the thickness was so great as to require the use of a trocar.* The remedy, however, is easy, viz. incision. Most of these causes of impotence admit of cure; but cancer in the uterus or vagina, fistulous communications with the bladder and rectum, scirrhus or dropsy of the ovaria, are generally incurable.

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* Morgagni de causis et sedibus Morborum.—Epist. 46.

Stricture of the cavity of the uterus,† or its solidity without the existence of any cavity,‡ deficiency of the ovaria, closure of the os uteri, or the fallopian tubes, will occasion sterility, but can be discovered only after death. The uterus has sometimes been altogether wanting; this can only be ascertained by examination: in this case the vagina is either very short, or no traces of it can be found.¶ Sterility, however, often exists where there is no reason to suspect disease or unnatural formation, and depends upon causes which our most minute investigation is not able to discover.

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* Edinburgh Med. Commentaries, vol. ii. part 2. case 4th.

† See Baillie's Morbid Anatomy.

‡ Outlines of Midwifery, by Alex. Hamilton, M.D. p. 119.

¶ Med. Tracts, vol. v. p. 92.

It would appear that women who have never menstruated are barren. Dr. Denman mentions two instances which came under his own knowledge.*

The theory of generation is a subject that has long claimed the attention, and engaged the labour of philosophers, though unsuccessfully; as it is still but very imperfectly understood. The evidence of medical men is sometimes required in cases of this kind before courts of judicature, and however painful it is to be obliged to reveal those secrets, which are confidentially communicated to us, it has been ruled that the confessions of a patient to his physician are not within the protection of the law, and though a medical man would be justly deemed dishonourable who voluntarily violates confidence reposed in him, he cannot withhold the fact when called upon in a court of justice.† "If a medical man was voluntarily to reveal these secrets, to be sure he would be guilty of a breach of honour and of

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[*] Introduction to Practice of Midwifery.

[†] Peake on the Law of Evidence, p. 188.

great indiscretion, but to give that information which by the law of the land he is bound to do, will never be imputed to him as any indiscretion whatever."*

HERMAPHRODITES.

By this term is meant, an animal, combining in its own person both the male and female parts of generation, and capable of begetting or conceiving. It is now admitted, that no such being of the human species ever existed, though it was formerly conceived possible, as by an old French law it was enacted, that they should choose one sex only, and keep to it. It is believed, that some animals, as worms, snails, leeches, and, perhaps, all those that have no bones, are true hermaphrodites. A *lusus naturæ* giving the appearance of a combination of the sexes, is frequent in inferior animals, particularly in sheep; it is sometimes seen in horses; and horned cattle so formed, are called fremartins: it is not very uncommon in the human species; but since the fabled union of Salmacis and Hermaphroditus, no individual human being is believed to be really capable of exercising both organs of generation.

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* Lord Mansfield on the Demur of Mr. Cæsar Hawkins, in the Dutchess of Kingston's Case.

Hermaphrodites are of two kinds;

1st, The male having a rima in the perineum, resembling the vulva of the female.

2d, The female having a large clitoris, resembling the penis.

The extraordinary appearance of the first case may arise from shortness or deficiency of the penis, the urethra opening at the glans or into the rima, which is not deep, and closed at the bottom. The rima is between the testes, which give the appearance of labia, and terminates in a cul-de-sac: in these cases the mammæ and uterus are wanting.

The appearance of the second or female hermaphrodite, is caused by an enlargement of the clitoris, a disease by no means uncommon in hot climates, which has given rise to the custom of female circumcision, sometimes practised in Asia and Africa:* it resembles the penis in size only, but not in structure, and the testes and beard are wanting.

The simple enlargement of the clitoris, without any admixture of the male and female organs sometimes exists; at birth it is in "such a case often larger than the penis of a male child of the same age; it has a well formed prepuce and glans, together with a fissure at its extremity, so as to resemble almost exactly the external appearance of the male organs. These cases have given rise to a mistake, with regard to the sex, and females have often been baptised for males. On most occasions, however, where there is an enlarged clitoris, the sex may be determined by the following circumstances:—the labia are well formed, and when handled no round bodies are felt in them like the testicles: the fissure at the extremity of the glans does not lead to any canal of the urethra, but under the glans, and at the posterior extremity of the fissure, there is an opening which leads immediately to the bladder. Such cases have often been mistaken for hermaphrodites."*

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* See Niebuhr's Travels, vol. ii. p. 250, and Dr. Winterbottom's History of Sierra Leone, vol. ii. p. 239.

A person, more nearly resembling the true hermaphrodite, is now exhibited in Paris, having the beard and large hairy limbs of a man, the clitoris resembling the penis, and the urethra terminating in its glans, with the breasts and passions of a woman; for a minute description of whom, given by the commission appointed by the *Faculté de Médecine* of Paris, I refer the reader to the 23d number of the London Medical Repository. Ambrose Paré mentions a case, where, by violent exertion, the male organs of generation became suddenly developed, and the person who had been before considered to be a woman, was admitted to the rights of manhood.† For similar instances, consult Montaigne's Essays, chap. xx. and Pliny, who says, he himself knew a case of this kind. Many cases are recorded, where, from the imperfect developement or defective formation of some of the parts of generation, and from the apparent admixture of others, it is difficult to determine to which sex the unfortunate person belongs, particularly during infancy; but as by matured age they are evolved, the characteristics of the sex commonly become evident. In persons thus formed, the passions are seldom very strong, and they are generally unable to perform the functions of either sex. There is a species of hermaphrodite, called by Sir Everard Home, neuter, "more common than is generally believed in their external appearance, some being an exact medium between the male and female, others having a greater resemblance to the one or the other sex; probably only those whose form is very like females, attract the notice of common observers, so as to have their defects discovered."* There has been observed in neat cattle a very rare mixture of the male and female organs;

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* See Dr. Baillie's Morbid Anatomy.

† A similar case, which happened at Thoulouse, is recorded by M. Veay, in the sixteenth volume of the Philosophical Transactions.

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* Home's paper on Hermaphrodites, in the Philosophical Transactions, for 1799.

this was noticed in an hermaphrodite bull, partaking so much of the bull, as to have the male organs capable of propagating the species, and an udder capable of secreting milk, with an external orifice in the situation of the vagina.*

Some subjects, usually treated of in works of this kind, as unnatural offences, &c. I have wholly omitted, because it does not appear that medical evidence can often be deemed necessary in courts of justice to prove their perpetration; and, should it be required, the injury which would probably be inflicted, must immediately suggest itself to the mind of every practitioner.

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* Home's paper on Hermaphrodites, in the Philosophical Transactions, for 1799.

APPENDIX.

Note A.—*Page* 125.

I MAY be expected to notice the assertion of Dr. Romero, a German physician, in a paper published by the College of Physicians, in the 5th vol. of their Transactions, wherein he has given what he considers the pathognomonic sign of death; he says, that if, in cases of sudden death, concentrated volatile alkali be insinuated by means of a feather into the nostrils a slight froth will be visible on the mouth. The phenomenon is rapid, and speedily vanishes; but if it does not appear, animation is supposed to be only suspended, and every effort should be made to promote the recovery. This observation, however, rests only on his own authority, and a sceptic would not, perhaps, be deemed possessed of extraordinary incredulity, although it is ushered into the world under the respectable sanction of the College of Physicians.

Note B.—*Page* 130.

THE Constitutio Carolina ordains, that a person found guilty of the crime of infanticide, shall be tied in a bag with a live cock and a cat, and thrown into a river. The

Roman law punished parricides by drowning them, enclosed in a bag with a dog, a viper, and an ape.

"In Denmark executions are rare: great numbers for child murder are condemned to work in spin houses for life, and to be whipped annually on the day when, and on the spot where, the crime was committed. This mode of punishment is dreaded more than death, and since it has been adopted has greatly prevented the frequency of the crime."* It is a humane and wise policy, rather to elicit reformation and repentance, than by one stroke to sweep away the criminal and his crime.

Note C.—*Page* 144.

The analogy of the chick chirping in the shell has been considered of sufficient weight to corroborate the probability of this circumstance. It has been urged, on the other hand, that the fœtus enveloped in membranes and surrounded by water, cannot so easily have access to air, which can readily permeate a porous egg shell; but it is well known, that the membranes are often broken, and the waters discharged some days before delivery, when the os uteri being dilated, air may enter, under which circumstances the fact of a child crying before birth, however improbable, does not seem impossible, and if the circulation through the cord were impeded, an effort to cry would be the natural consequence.

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* Howard on Prisons.

Note D.—*Page* 148.

" GALEN was of opinion that this closure (of the ductus arteriosus and foramen ovale) took place between the first and fifth days after birth." " Our author, after repeated observations on the dead bodies of infants, at different periods, after birth, and upon animals, has demonstrated that the above-mentioned modes of passage round the heart are not closed so soon as Galen said, but in the space of *not less than two months* after birth. He remarked farther, with wonderful care, that the membrane of the *foramen ovale* in infants newly born, at first begins to become more compact and less pellucid than before, and then adheres firmly to the edges of the *foramen ovale*, so as only to leave at the upper part a narrow opening of communication between the two auricles of the heart; which, opening about the *second month*, closes entirely."

See Scarpa's Life of Carcano Leone,
translated by Wishart, p. 47.

Note E.—*Page* 169.

" VALLESIUS membranam istam plane rejicit. *Columbus* ait, hymena raro adesse; et testatur se ter duntaxat illum invenisse; bis in duabus parvulis puellis, & semel in natu majore. *Paræus de hom. generat. c.* 42. scribit, se hymena semel tantum in virgine 17 annos nata deprehendisse: in aliis nunquam: ad horum sententiam suum quoque judicium adscribit *Laurentius*. Credit hymena figmentum esse; quoniam si adesset nullum usum haberet. At natura nihil frustra molitur. Quodsi adsit præter naturam adesse putat, et morbum esse organicum in vitiata conformatione opiniatur.

Lis erat, Romæ inter *Bartholomæum Eustachium*, et *Realdum Columbum*. Is enim hymenis præsentiam negabat, hic affirmabat. Provocatum ad *αὐτοψίαν*. Secuit *Columbus* in Xenodochio D. Mariæ consolationis, Virgines duas, alteram 9, alteram 12 annorum, in magna hominum corona, et hymen non invenit."

Sebizius de notis Virginitatis.

These quotations are not given with a view of supporting an opinion that such a membrane as the hymen has no existence, for it probably does generally exist, but to prove that it is frequently absent in the natural and immaculate state.

Note F.—*Page* 171.

HUXHAM, describing a case of præternatural formation of the female genital organs, where pregnancy had been effected, says,—" Summa enim penis glans in hoc orificium vix fuit intromissa, multum minus ipsa virga. quærat fortasse aliquis quo forte modo gravida facta fuit muliercula nostra; illi responderem, penis intrusionem ad prolem concipiendam haud absolute necessariam; seminis autem intra vaginam ejaculationem quam maxime."

Philosophical Transactions, vol. xxxii. *p.* 408.

Note G.—*Page* 217.

On this subject few, I trust, will subscribe to the sanguinary notions of the celebrated historian and physician, who says,—"Perhaps it might be no absurd nor unreasonable regulation in the legislature, to divest all lunatics of the privilege of insanity, and in cases of enormity subject them to the common penalties of the law; for, although in the eye of casuistry, consciousness must enter into the constitution of guilt, the consequences of murder, committed by a maniac, may be as pernicious to society as those of the most criminal and deliberate assassination, and the punishment of death can be hardly deemed unjust or rigorous, when inflicted upon a mischievous being, divested of all perceptions of reason and humanity."* Instead of increasing our capital punishments, which are unhappily too frequent, would it were the policy of our legislature to imitate the code of the grand Duke of Tuscany, and abolish the punishment of death altogether, except perhaps in cases of premeditated murder.—"We have seen," says that Prince, "with horror, the facility with which, in the former laws, the pain of death was decreed, even against crimes of no very great enormity, and that the government in the punishment of crimes ought always to employ those means which, whilst they are the most efficacious, are the least hurtful to the offender, which efficacy we find to consist more in condemning the said offender to hard labour during the term of his natural life, than in putting him to death, since the former serves as a lasting example, and the latter only as a momentary object of terror, which is often changed into pity; and since the former takes from the delinquent the possibility of committing the same crime again, but does not destroy the hope of his reformation, and his becoming once more an useful subject: and, having considered, besides, that a legislation, very different from our preceding one, will agree better with the gentle manners of this polished age, we are come to the resolution to abolish, and we actually abolish for ever by the present law the pain of death."*

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* Smollet's History of England, reign of George II.

It is horrible to reflect with what facility death is inflicted in this country, were so great a reward is paid by act of parliament to informers on the conviction of their unhappy victims. It is to be hoped, that the developement of the infamous conspiracies, which have lately been discovered among the blood-hounds of the Police, miscalled Peace Officers, to entrap the innocent and unwary, will stimulate the legislature to re-examine at least, if not new model our sanguinary penal code. "Many melancholy instances have occurred to shew, that the reformation of that code is become an important and almost necessary work."†

In 1755, Mac'Daniel, Berry, Egan, and others, were convicted at the Old Bailey of enticing persons to commit offences, and procuring innocent persons (some of whom were executed) to be convicted of robberies, for the sake of the reward, yet this system is still continued.

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* Edict of Peter Leopold, Grand Duke of Tuscany, for the reform of Criminal Law, 1786.

† Eden's Principles of Penal Law.

Note H.—*Page* 248.

THERE are two accounts in the Philosophical Transactions of weathers suckling lambs,* and cases of women, one sixty, the other sixty-six years of age, (who had not conceived for many years,) giving suck to their grandchildren.†

"Une fille de service, obligée de faire coucher dans sa chambre un enfant qu'on voulait sevrer et qui dérangeait son repos: imagina de lui donner son sein pour apaiser ses pleurs qui l'importunaient; au bout de peu de temps, cette fille eut assez de lait pour satisfaire cet enfant. La fille d'Alençon, qui fut présentée à l'académie de chirurgie, et dont parle Baudelocque, confirme d'une manière bien authentique cette verité. Je connais une femme qui n'ayant pas eu d'enfant depuis onze ans, a encore assez de lait dans les mamelles pour pouvoir nourrir.‡

Lest I should incur the imputation of credulity, I beg to state, that although it is proper to mention, and give my authorities for these circumstances, I am not called upon to say what degree of credit I attach to them.

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* Vol. xviii. and xlv.

† Vol. ix. and Diemerbroeck Anat. lib. ii. cap. 2.

‡ Cours de Medicine legale par. J. J. Belloc, p. 70.

Note I.—*Page* 260.

The propriety of this is illustrated by the remarkable case of John Bury, in the reign of Queen Elizabeth, which is a proper caution against such demands for annulling marriage: his first wife, Willimot, libeled him for impotency, and on the inspection and evidence of two physicians, it appeared, that he had but one little testicle of the size of a small bean, and that she was a virgin; on this, and other circumstantial evidence, the ecclesiastical court annulled the marriage. The husband took a second wife, by whom he had a son; this drew the succession of his estate into question on the legitimacy of this son. The common lawyers were unanimously of opinion, that the ecclesiatical court was deceived on the very ground on which they annulled the marriage, and the first marriage was pronounced valid notwithstanding it.*

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* See Appendix to Hargrave's Trials, vol. x. p. 24.

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